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ORIGINAL

Impact of Emotional and Psychological Issues on Hematologic Cancer Patients Undergoing Stem-Cell Transplants

Impacto de los problemas emocionales y psicológicos en pacientes con cáncer hematológico sometidos a trasplantes de células madre

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ABSTRACT

Hematopoietic stem cell transplant (HSCT) morbidity has decreased in recent decades owing to improvement in post-transplant concern with transplantation therapy. However, psychological discomfort is common among HSCT patients, and it can have a detrimental effect on function, recovery, and health outcomes, including an increased risk of implant with host illness and mortality. Several improved health outcomes and increased treatment participation are the results of properly diagnosing and treating these psychological problems. The principle of the investigation is to observe the psychological and emotional challenges that recipients of stem-cell transplants who have hematologic malignancies face. It aims to assess how these issues affect patients' overall quality of life (QoL), persistence in treatments, and recovery outcomes. For the examination, 70 people with Hematologic cancer of HSCT were considered, to analyze the emotional and psychological issues within the patients during their stay in the hospital. Statistical Package for Social Sciences (SPSS) was analyzed and the findings show that the research used methods such as the paired t-test, Wilcoxon Signed-Rank Test and Regression analysis. Anxiety levels decreased from 28,6 % to 14,3 % and depression levels from 21,4 % to 14,3 %, respectively, following SCT, based on the analysis.

Keywords: Brain Emotional Well-Being; Psychological Challenges; Quality of Life (Qol); Hematologic Malignancies; Stem Cell Transplant (SCT); Emotional Resilience.

RESUMEN

La morbilidad del trasplante de células madre hematopoyéticas (TCMH) ha disminuido en las últimas décadas gracias a la mejora de la atención posoperatoria en la terapia de trasplante. Sin embargo, el malestar psicológico es común entre los pacientes de TCMH y puede tener un efecto perjudicial en la función, la recuperación y los resultados de salud, incluido un mayor riesgo de implante con enfermedad del huésped y mortalidad. Varios resultados de salud mejorados y una mayor participación en el tratamiento son el resultado de diagnosticar y tratar adecuadamente estos problemas psicológicos. El principio de la investigación es observar los retos psicológicos y emocionales a los que se enfrentan los receptores de trasplantes de

células madre que padecen neoplasias hematológicas. Su objetivo es evaluar cómo estos problemas afectan a la calidad de vida (CV) general de los pacientes, la persistencia en los tratamientos y los resultados de la recuperación. Para el examen, se consideró a 70 personas con cáncer hematológico de TCMH, con el fin de analizar los problemas emocionales y psicológicos de los pacientes durante su estancia en el hospital. Se utilizó el paquete estadístico para ciencias sociales (SPSS) y los resultados muestran que la investigación utilizó métodos como la prueba t pareada, la prueba de rangos con signo de Wilcoxon y el análisis de regresión. Según el análisis, los niveles de ansiedad disminuyeron del 28,6 % al 14,3 % y los niveles de depresión del 21,4 % al 14,3 %, respectivamente, tras el TCMH.

Palabras clave: Bienestar Emocional Cerebral; Retos Psicológicos; Calidad de Vida (CV); Neoplasias Hematológicas Malignas; Trasplante de Células Madre (TCM); Resiliencia Emocional.

INTRODUCTION

Hematologic malignancies are a serious health issue with notable societal and economic repercussions because of their sharp rise in occurrence in recent decades, particularly in wealthy nations. Numerous research have shown that hematologic malignancies (HM) negatively impact the Quality of Life (QoL), healthcare-considered expenses among the population.[1] When combined with varying degrees of severity or chronicity of issues, pain intensity, and decreased functionality can have a substantial effect on a patient's overall health by aggravating physical and mental health and lowering QoL. One of the most popular metrics for evaluating treatment approaches and tactics meant to enhance mental health is QoL. Research on chronic pain and patients with serious medical disorders have also looked closely at QoL.[2,3] Psychometric examinations, primarily questionnaires, are used to assess patients' QoL. The majority of measuring tools offer a comprehensive, all-encompassing approach to QoL, evaluating various elements like psychological well-being that could influence an individual's QoL to some extent, including the physical surroundings, Ability to afford extent of learning, and job prospects.[4,5] The increasing adoption of the biopsychosocial representation of strength in the systematic medical community has a larger focus on the research of psychosocial aspects impacting the course with incidents of severe disease.[6] According to the area of psycho-oncology, which considers cancer from a psychological perspective, the majority of cancer patients struggle with a variety of interpersonal and personal issues and anxieties known as the "6 D's" Discomfort, reliance, incapacity, disfigurement, disturbance, and mortality are some of these problems. Hematological cancer patients have several challenges, according to research looking at their QoL.[7] It should come as no surprise that patients with HM have worse general health and increased levels of pain and exhaustion, which are typical of these illnesses.[8] Additionally, patients exhibit cognitive deficits, including memory and attention issues, elevated concern and sadness, and reduced sexual interaction, all of which were linked to the emergence of a negative body image. Increased amount of stress, anxiety, and dread characterize their connections with family members, which are similar to be enhanced in many circumstances. Additionally, their amicable relationships could be damaged. Because cancer handling is regularly expensive with almost always takes place in cities, requiring patients and their families to relocate temporarily, these people also face financial and occupational challenges related to the suppression caused by their illness.[9,10]

The most prevalent mechanism of psychological suffering in allogeneic HSCT manifests itself through depressive disorders.[11] The association involving therapeutic learning treatments and results in these patients, by a focus on psychological fitness outcomes, have not yet been thoroughly examined. Understanding the extent to which instructive involvement can serve as a defensive issue in averting problems connected to psycho-emotional discomfort. The author described the changes in older persons receiving HSCT in terms of their QoL, physical functioning, and psychological distress.[12] It was to assess parameters related to the QoL trajectory in older persons following HSCT and to compare the QoL with psychological suffering trajectories of elder and younger adults undergoing HSCT.

Twelve allogeneic HSCT patients who were within six months of their transplant without any issues and thirteen allogeneic HSCT recipients who were more than six months after their transplant and suffering from chronic graft-versus-host disease participated in semi-structured qualitative interviews. The author investigated how allogeneic-HSCT survivors' daily lives are impacted by cognitive challenges.[13] Twenty allogeneic-HSCT survivors are receiving follow-up treatment at a tertiary oncology facility. Semi-structured interviews were used.[14] Research identified the variables linked to reduced self-efficacy and evaluated how perceived self-efficacy affected fatigue, sadness, distress, and QoL.[15] In children undergoing HSCT, investigated the connections between QoL and parental psychological distress and symptom load.[16] A longitudinal, repeated-measures strategy was employed in the investigation. Parents who spoke English or Spanish and their kids between the ages of 2 and 18 who were scheduled to receive HSCT therapy were eligible.

The analysis proposes to investigate the psychological and emotional difficulties that patients with HM who are receiving stem-cell transplants encounter. It seeks to evaluate the impact these problems have on patients' general QoL, compliance with treatment, and results of their recovery. It also pinpoints particular psychological elements that contribute to coping strategies, anxiety, and sadness throughout the transplantation procedure.

METHOD

For further understanding of the hospital patients' emotional and psychological issues during their hospitalization, 70 patients having hematologic malignancy of HSCT were selected. The results depicted by the analysis that was undertaken using the SPSS work indicate that the evaluation undertook the use of the regression analysis, the paired t-test, and finally the Wilcoxon Signed Rank Test. Figure 1 represents the methodology flow.

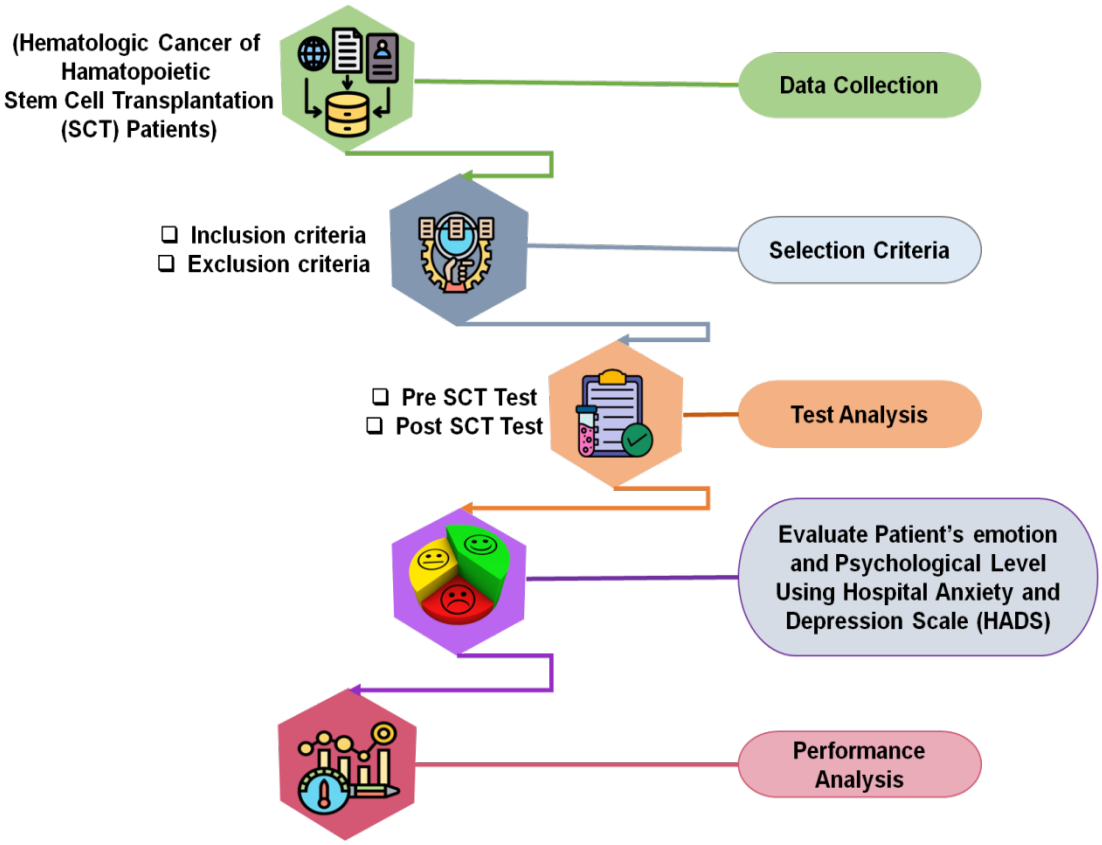

Figure 1. Methodology flow

Data collection

For the examination, 70 patients with Hematologic cancer of HSCT were considered, to explain and diagnose all the exciting and emotional problems of patients throughout their stay in the hospital. Altogether, 70 patients with HM intended for HSCT are described in the demographic data in table 1. It is critical to understand the psychological characteristics of the benefits. These characteristics could influence the psychological outcomes of the population after transplantation while receiving treatment. Such a range of samples allows for considering demographic characteristics as factors affecting the emotional and psychological problems of these people.

Table 1. Demographic data

Variables	Category	Participants N=70 (%)
Age	18-30	10 (14,3)
	31-40	15 (21,4)
	41-50	20 (28,6)
	51-60	15 (21,4)
	61 and above	10 (14,3)
Gender	Female	35 (50)
	Male	35 (50)

Type of Hematologic Malignancy	Acute Lymphocytic Leukemia	15 (21,4)
	Acute Myeloid Leukemia	10 (14,3)
	Chronic Lymphocytic Leukemia	10 (14,3)
	Multiple Myeloma	20 (28,6)
	Other	15 (21,4)
Duration of hospitalization (days)	5 - 7	25 (35,7)
	8 - 14	20 (28,6)
	15 - 21	15 (21,4)
	More than 21	10 (14,3)
Education level	No formal education	5 (7,1)
	Diploma	20 (28,6)
	UG	30 (42,9)
	PG	15 (21,4)
Socioeconomic status	Low	15 (21,4)
	Middle	40 (57,1)
	High	15 (21,4)

Selection criteria

Participants receiving HSCT were chosen based on accurate inclusion and exclusion criteria to guarantee the analysis's validity and relevance.

Inclusion criteria

- Hematologic Malignancy Diagnosed: participants must possess a valid hematologic cancer diagnosis.
- Only patients who are undergoing or getting ready for hematopoietic stem cell transplantation are listed as scheduled for HSCT.
- To provide their informed permission and understand the psychological assessments, participants in the analysis must be at least eighteen years old.

Exclusion criteria

- Severe Mental Disorders or Cognitive Impairment: individuals who already have serious mental health issues that could compromise the reliability of psychological tests are not allowed to participate.
- Refusal to Participate: People are not allowed to participate if the participants refuse to give their informed consent or do not want to finish the necessary tests and questionnaires.

Test analysis

To assess the emotional, psychological, and functional difficulties that patients with HM encounter throughout their treatment, the analysis performed examinations both pre and post-SCT. The purpose of these tests was to measure how patients' QoL, coping mechanisms, and mental health changed both before and after the transplant.

Pre-sct test

These parameters include the physical, psychological, and emotional state of the patients on admission and before transplant and the determination of any chronic diseases such as stress, anxiety, or depression that may affect their line of treatment. The test stage ensures that the physicians will be able to tell which individuals might require more mental health assistance in the course of the process. Information concerning the functional abilities to handle the challenges of stem-cell transplantation in the future, coping strategies, and resilience of the patient are also elicited.

Post-sct test

After the procedure, the transplant follow-up determines shifts in mental state, stress levels, and the patient's QoL and helps in recovery assessment by establishing trends in cognitive impairment, anxiety, depression, and fatigue, which are characteristic of the recovery phase. Also look at coping patterns and other issues related to treatment compliance and social rehabilitation because it aims at enhancing the success of recovery as well as the overall well-being of the patients involved for the rest of their lives.

Emotion and psychological measures

Hospital Anxiety and Depression Scale (HADS) and Common Terminology Criteria for Adverse Events (CTCAE) were used to measure depression and anxiety levels pre and post-SCT. The final scores for Depression (HADS-D) and Anxiety (HADS-A) are calculated by adding the seven items for each condition. The range of these scores is 0 to 21. There is no anxiety or depression if the score is less than eight; a possible anxiety or depression condition is indicated if the score is between eight and ten; and a considerable anxiety or depression and hence a very likely psychiatric disorder is indicated if the score is greater than ten.

The CTCAE scale is used to rate the severity of adverse events that patients receiving HSCT encounter both before and after the procedure. The scale is used to methodically record the frequency and severity of toxicities, including neurological, gastrointestinal, and hematological symptoms, enabling a thorough assessment of the patient's health. By using a toxicity scale ranging from Grade 1 (mild) to Grade 3 (severe), it helps to optimize the treatments of patients who are at risk for serious consequences, and improve recovery and long-term health in the susceptible group.

Psychological evaluation

The International Classification of Diseases (ICD)-aligned structured questionnaire survey used for the pre-and post-SCT mental evaluation focused on anxiety, and adjustment issues that are frequently seen in cancer patients. Thus, the pre-SCT examinations calculated pre-existing issues such as anxiety and depression, the evaluation of the client's Emotional Readiness, Coping Style, and Social Support network aimed to set up a benchmark of mental health to best further create personalized individual SCT treatments. The self-administered questionnaire was adapted for completion post-SCT to detect any new/emerging psychiatric issues like fatigue, sadness, or new cases of intellectual incompetence that first present during recovery. Besides, the survey looked at different forms of differences in patients' emotional status, treatment adherence, as well as reconstruction of their social relationships to assess patients who could need more attention to their psychological states.

Statistical analysis

The patient data was analyzed by comparing key statistical features and carrying out a vast array of important tests using the statistical software for Social Sciences namely SPSS. For the investigation, three methods like, the Wilcoxon Signed-Rank Test, Regression analysis and paired t-test have been used to measure the scores of pre and post-SCT concerning the patient's emotional and psychological level. Due to the pairing of subjects before and after SCT, the non-parametric Wilcoxon Signed-Rank Test was implemented to relate pre-and post-SCT data. The paired t-test if used appropriately for continuous factors such as anxiety or QoL directly contrasts the mean of two related groups. It assesses the impact of SCT on a patient's psychological health. Regression analysis looks at how one or more predictor variables are or are associated with one criterion variable. In patients with HM undergoing SCT, it identifies factors associated with emotional dysfunction and QoL.

RESULTS

The principle of the investigation is to observe the psychological and emotional challenges that recipients of stem-cell transplants who have HM face. It assesses how these issues affect patients' overall QoL, treatment adherence, and recovery outcomes.

Measures analysis

Table 2. HADS analysis

Measures	Pre-SCT Diagnosis (%)	Post-SCT Diagnosis (%)	Overall prevalence (%)
HADS-A			
No Anxiety (< 8)	20 (28,6)	36 (51,4)	20 (28,6)
Possible (8-10)	30 (42,9)	24 (34,3)	30 (42,9)
Significant (>10)	20 (28,6)	10 (14,3)	20 (28,6)
HADS-D			
No Anxiety (< 8)	25 (35,7)	40 (57,1)	25 (35,7)
Possible (8-10)	30 (42,9)	20 (28,6)	30 (42,9)
Significant (>10)	15 (21,4)	10 (14,3)	15 (21,4)
CTCAE			
Grade 1 (Mild)	35 (50)	45 (64,28)	35 (50)
Grade 2 (Moderate)	20 (28,6)	15 (21,4)	20 (28,6)
Grade 3 (Severe)	15 (21,4)	10 (14,3)	15 (21,4)

The prevalence of mental illnesses and degrees of toxicity among 70 patients both before and after SCT are shown in table 2. As measured by the HADS-A, the proportion of patients who reported no anxiety (significant) rose dramatically from 20 (28,6 %) before SCT to 36 (51,4 %) after SCT, suggesting that their emotional health had improved. Those who were categorized as having possible anxiety, on the other hand, decreased from 20 (28,6 %) to 10 (14,3 %), indicating a decrease in anxiety following the treatment. According to the HADS-D, the proportion of participants without anxiety increased from 25 (35,7 %) to 40 (57,1 %), whereas the proportion of participants with depression (significant) reduced from 15 (21,4 %) to 10 (14,3 %). The percentage of individuals with grade 1 (mild) toxicity, as determined by the CTCAE, rose from 35 (50 %) to 45 (64,28 %). Grade 2 (moderate) and Grade 3 (severe) toxicities, on the other hand, declined, suggesting that patients' health had generally improved and that there had been fewer significant side effects following SCT. These results imply that after therapy, there will be improvements in both physical and mental health.

Wilcoxon signed- rank test analysis

Based on demographic factors, table 3 displays the QoL Wilcoxon Signed-Rank Test findings for survivors (N=70). Important results include the kind of hematologic malignancy, which indicated different QoL improvements (p = 0,002), and age, where patients had a higher reduction in QoL (p = 0,012). Gender tends to be significant (p = 0,064), which could have an impact on QoL results. These results highlight the importance of taking demographics into account when managing and caring for patients.

Table 3. Wilcoxon Signed-Rank Test

Variables	z- statistic	p-value	Median pre-SCT score	Median post-SCT score
Age	-2,500	0,012	18	14
Gender	-1,850	0,064	16	14
Type of Hematologic Malignancy	-3,120	0,002	20	15
Duration of hospitalization (days)	2,200	0,028	17	12

T-paired test analysis

Following SCT, the QoL significantly improved across all demographic groups, according to the paired t-test results (p < 0,05) were presented in table 4. Overall, the 70 Participants' QoL improved for both men and women, while the gain was marginally larger for women. Following SCT, patients with multiple myeloma and those who were admitted for more than 21 days reported significant improvements in their QoL. Both before and after SCT, higher socioeconomic position and education were linked to improved QoL. All things considered, the data shows steady gains in QoL across a range of age groups, cancer types, and other demographic characteristics.

Table 4. t-paired test analysis

Variables	Pre-SCT QoL (Mean ± SD)	Post-SCT QoL (Mean ± SD)	t-value	p-value
Overall age	7,3 ± 1,6	5,2 ± 1,3	6,50	0,000
Gender				
Female	7,0 ± 1,5	5,0 ± 1,3	5,00	0,000
Male	7,2 ± 1,6	5,2 ± 1,2	4,50	0,000
Type of Hematologic Malignancy				
Acute Lymphocytic Leukemia	7,5 ± 1,7	5,3 ± 1,4	4,20	0,000
Acute Myeloid Leukemia	6,8 ± 1,4	4,8 ± 1,1	5,10	0,000
Chronic Lymphocytic Leukemia	6,9 ± 1,5	5,1 ± 1,2	3,80	0,000
Multiple Myeloma	7,4 ± 1,6	5,4 ± 1,3	4,40	0,000
Other	7,1 ± 1,5	5,0 ± 1,2	4,60	0,000
Duration of hospitalization (days)				
5 - 7	6,5 ± 1,5	4,0 ± 1,0	4,75	0,000
8 - 14	7,5 ± 1,8	5,2 ± 1,3	3,70	0,000
15 - 21	7,0 ± 1,5	5,0 ± 1,1	4,30	0,000
More than 21	8,0 ± 1,8	6,0 ± 1,4	3,50	0,001

Regression analysis

Table 5 shows that emotional and anxiety levels significantly decreased after SCT, in patients (p=0,009) and those who stayed in the hospital longer (p=0,012). Emotional results following SCT did not significantly correlate with either gender or type of cancer. These results demonstrate how age, education, and economic status affect post-SCT recovery and mental health.

Table 5. Regression analysis

Variables	β - coefficient	Stand error	t-value	p-value
Age (per year)	-0,038	0,014	-2,71	0,009 **
Gender (male=1, female=1)	-0,076	0,053	-1,43	0,156
Type of Hematologic Malignancy				
Acute Lymphocytic Leukemia	-0,098	0,066	-1,48	0,142
Acute Myeloid Leukemia	-0,065	0,061	-1,07	0,290
Chronic Lymphocytic Leukemia	-0,088	0,064	-1,38	0,171
Duration of hospitalization (days)	-0,081	0,031	-2,61	0,012 *

DISCUSSION

The result shows a significant reduction in anxiety and emotional distress among recipients of stem-cell transplants after treatment, underscoring the beneficial effects of SCT on mental health. Significant gains were seen in older patients and those who had been hospitalized for longer periods, indicating that these variables have a significant impact on recovery. Additionally, improved emotional well-being was linked to both socioeconomic status and higher education levels, highlighting the significance of social factors in patient outcomes. It's interesting to note that emotional recovery did not significantly connect with either gender or the type of hematologic malignancy, indicating that psychological care ought to be accessible to everyone. All things considered, these findings highlight the necessity of specialized psychological therapies to promote mental health following SCT, especially for vulnerable populations.

CONCLUSIONS

The examination determines that SCT dramatically enhances emotional well-being, as seen by the reduction of anxiety levels from 28,6 % to 14,3 % and depression levels from 21,4 % to 14,3 % following therapy. Emotional improvements were higher among older patients (p=0,009) and those who were in the hospital longer (p=0,012). The significance of addressing psychological support in the post-transplant management of patients with hematologic malignancy is underscored by these findings. To advance the recovery outcomes for patients with hematologic malignancies, further research should concentrate on developing customized psychological support programs and conducting longitudinal research to evaluate the effect of SCT on emotional and psychological well-being.

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CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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