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Clinical Determinants of Quality of Life in Elderly Patients with Hematological Malignancies: A Cross-Sectional Analysis

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Abstract

Objective: This study evaluates clinical factors affecting the quality of life (QoL) in elderly patients with hematological malignancies

Method: A cross-sectional, single-center study was conducted from April to September 2024, involving patients aged 65 and older with hematological malignancies. QoL was assessed using the EORTC QLQ-C30 questionnaire. Functional status was evaluated using the ECOG performance scale, activity of daily living (ADL), instrumental activity of daily living (IADL), and Clinical Frailty Scale (CFS). Nutritional status was analyzed using the Mini Nutritional Assessment (MNA-SF), and depressive symptoms were assessed with the Geriatric Depression Scale (GDS-15). Parameters were compared by gender, age (<75 years and ≥75 years), and chemotherapy status, with correlation analyses to explore relationships.

Results: The study included 147 patients with a median age of 72.5 ±6.3. Significant correlations were found between functional scores and QoL indicators: negative correlations with ECOG and CFS (r=-0.336 to -0.618, p<0.001) and positive correlations with ADL and IADL scores (r=-0.336 to -0.628). Common symptoms included fatigue, nausea, and insomnia, with notable correlations to clinical parameters. Women reported worse scores in physical assessments and emotional/social functioning, experiencing higher levels of fatigue, pain, and insomnia.

Conclusion: Functional disorders, depression, and nutritional status significantly impact the QoL of elderly patients with hematological malignancies, underscoring the need for a multidisciplinary health management approach.

Keywords: EORTC QLQ-C30, hematologic malignancy, frailty, depression, nutrition

INTRODUCTION

Hematological malignancies encompass a range of diseases, including leukemia, lymphoma, multiple myeloma, and myelodysplastic syndromes. These conditions are particularly prevalent in the elderly population and pose significant health challenges and their incidence increases with age and is often complicated by comorbidities, polypharmacy, and a decline in functional capacity (1). The burden of these malignancies is significant in elderly patients, with a negative impact on not only life expectancy but also quality of life. The quality of life assessment is vital in determining treatment goals and developing individualized approaches for these patients.

The quality of life in elderly patients is determined by multiple factors, including physiological changes, cognitive function loss, social isolation, physical limitations, and psychological problems (2). These factors can have a direct impact on individuals' response to treatment, their ability to maintain daily life activities, and their overall health status. The personalization of healthcare services and increased patient compliance with treatment can be achieved by holistically addressing these elements that affect quality of life. Regular evaluation of the factors that determine quality of life helps to gain a wider perspective on health status and prevent possible complications (2).

Assessing quality of life with scales is an objective tool that allows individuals to assess their physical, psychosocial, and functional status. These scales help measure the effects of the disease on daily life and the symptom burden of the treatment process on patients. Some tools such as EORTC QLQ -30 (European Organization for Research and Treatment of Cancer

Quality of Life Questionnaire Core 30), FACT (Functional Assessment of Cancer Therapy) Scale, POMS (Profile of Mood States) are widely used in malignancies (2-4). Particularly in patients with hematologic malignancies, these assessments provide important information for monitoring response to treatment, personalizing disease management, and improving the quality of care.

Elderly patients with hematological malignancies in the literature typically concentrate on the clinical course of the disease, side effects related to treatment, symptom burden, and treatment compliance (5). Although these studies provide valuable information on disease management, they often overlook other significant factors that influence quality of life in the geriatric patient population. The quality of life of these patients can be significantly impacted by factors such as treatment side effects, chronic symptom burden, and comorbidities, as studies have shown. However, the effects of factors such as frailty, physical activity level, psychosocial factors and nutritional status on the quality of life of elderly patients have generally not been sufficiently studied. The evaluation of such factors is important not only to understand the current health status of individuals but also for a comprehensive approach to improve the quality of life of patients. The evaluation of the quality of life in elderly patients with hematological malignancies and the determination of the factors affecting this quality is of great importance for the development of individualized treatment approaches. This study aims to evaluate the quality of life in elderly patients with hematological malignancies and to reveal the clinical factors that may be associated with it.

METHODS

Study Design and Participants

This cross-sectional, single-center study was conducted on patients aged 65 years and older who were admitted to a tertiary geriatric outpatient clinic between April 2024 and September 2024. Patients diagnosed with hematological malignancies [multiple myeloma (MM), myelodysplastic syndromes (MDS), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), chronic myeloid leukemia (CML), myeloproliferative neoplasms (MPN) and other malignancies] were included in the study. Patients who had communication limitations, severe neuropsychiatric disorders, active infections, severe metabolic disorders, and/or required hospitalization for any reason, as well as those who needed palliative care, were not included in the group. In addition, the standardized Mini-Mental State Examination (sMMSE) test was used for cognitive assessment, and individuals with a score of ≤24 were considered to have cognitive impairment and were excluded from the study because it was thought that the quality of life index would be affected (6). Written informed consent was obtained from all participants, and the study complied with the ethical principles in the Declaration of Helsinki. The local ethics committee approved the study.

Sociodemographic and Clinical Data

Sociodemographic data of the participants, such as age, gender, and marital status, were obtained through face-to-face interviews and medical records. In addition to the hematological malignancies of the participants, other comorbidities (hypertension, diabetes mellitus, cardiovascular disease, chronic obstructive pulmonary disease, cerebrovascular accident) were recorded. The overall burden of comorbidities was assessed and scored with the Charlson Comorbidity Index (CCI) (7). Height and weight were measured and body mass index was calculated and recorded. Drug history was questioned in detail and active chemotherapy status was also determined. Active chemotherapy agents were not included when calculating the number of drugs. Polypharmacy status was considered as the use of five or more drugs at the same time and recorded (8).

Quality of Life Assessment

The quality of life assessment in the study was conducted using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-30)(9).EORTC QLQ-C30 is a scale that evaluates the quality of life of cancer patients with a multidisciplinary approach and is widely used in clinical research. This questionnaire analyzes the quality of life of patients in a wide range of 15 subparameters, including functional scores such as physical, role, emotional, cognitive, and social functioning, symptom scores such as fatigue, nausea and vomiting, pain, dyspnea, loss of appetite, insomnia, constipation, diarrhea, and financial difficulties, and a general health score. The physical and psychosocial status of individuals is revealed by functional scores, while symptom scores aim to determine side effects that occur during the disease and treatment process. The general health score assesses patients' general health perception and quality of life. The scale has 30 questions, 28 of which are Likert-type scales, and the last two questions evaluate global health status. Each subscale is obtained by summing the raw scores given to the survey responses, and then the scores are converted to a percentage score between 0-100. Higher scores indicate a better quality of life in general health and functional scales, while high scores in symptom scales indicate greater symptom severity or worse health status (9).

Multidimensional Health and Function Assessment

This study evaluated the patient's general health status, physical capacity, nutritional status, and mental status using a series of standard tests and scales. Functional status was assessed with the Eastern Cooperative Oncology Group (ECOG) performance scale (10).In addition, activities of daily living (ADL) and instrumental

Table 1. Socio-demographic characteristics and laboratory parameters of 27 patients participating in the study

Variable	Mean ± SD (range)/ median (min/max)
Age; year	59.7±10.3
Gender (Femal/Male); n and (%)	16/11 (59.3/40.7)
Dialysis time; months	32 (18/30)
Urea; mg/dL	123.26 ± 36.02
Creatinine; mg/dL	7.4 ± 1.9
Albumin; g/dL	3.58 ± 0.32
Alanine aminotransferase; U/L	15 (8 – 49)
Sodium; mmol/L	137.5 ± 3.45
Potassium; mmol/L	5.08 ± 0.69
Calcium; mg/dL	8.5 ± 0.63
Phosphorus; mg/dL	4.9 ± 1.24
Hemoglobin; g/dL	10.6 ± 1.16
White blood cell; 10^6/L	6260 ± 1639
Platelet; 10^6/L	194.78 ± 53.7
Ferritin; ng/mL	340 (118 – 805)

activities of daily living (IADL) were assessed with the Katz ADL Scale out of 6 points and the Lawton Broady IADL Scale out of 8 points, respectively (11,12). Frailty status was determined with the Clinical Frailty Scale (CFS). The use of this scale in daily elderly assessment practice is common due to its ease of application and its critical role in predicting morbidity and mortality risks for individuals. The assessment is conducted on a scale of 1 (very fit) to 9 (terminal ill), with a higher score indicating a worse condition (13). The nutritional status of the patients was analyzed with the Mini Nutritional Assessment – Short Form (MNA-SF). This scale is scored out of a maximum of 14 points, with 8-11 points indicating malnutrition risk and ≤ 7 points indicating malnutrition (14). The Geriatric Depression Scale-15 (GDS-15) was used to evaluate depressive symptoms. This scale evaluates out of a maximum of 15 points, with higher scores being worse and ≥5 points being considered significant for depression (15).

STATISTICAL ANALYSIS

All data were analyzed using the Statistical Social Sciences Package (SPSS) version 24 (IBM SPSS Inc., Chicago, USA). First, descriptive statistics were performed for socio-demographic and clinical characteristics and clinical tools and scales. Patients were compared according to three basic variables: gender, age groups (<75 years and ≥75 years) and chemotherapy status. Numerical variables were presented as mean, standard deviation, median, minimum and maximum values; while categorical data were reported as frequency and percentage. The conformity of the data to normal distribution was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Parametric tests were preferred for data suitable for normal distribution, and non-parametric tests were preferred for data not suitable for normal distribution. Independent sample t-test or Mann-Whitney U test was used to compare numerical data between groups. Independent sample t-test was used to compare numerical variables suitable for normal distribution; The Mann-Whitney U test was used to compare numerical variables that did not conform to a normal distribution. The Chi-square test or Fisher's exact test was utilized when comparing categorical data. In the second stage, correlation analysis was performed between all numerical data. Pearson correlation analysis was used for data that conformed to a normal distribution, and Spearman correlation analysis was used for data that did not conform to a normal distribution. The correlation analysis results were interpreted using the r value, and the r value <0.10 was analyzed as a very weak relationship, between 0.10-0.29 as weak, between 0.30-0.49 as moderate, between 0.50-0.69 as strong, and between 0.70-0.90 as a very strong relationship (16). In all evaluations, statistical significance was accepted as $p<0.05$.

RESULTS

Baseline Characteristics

A total of 147 patients aged 65 years and over with hematologic malignancies, with a mean age of 72.5 (±6.3), were included in the study. More than half of the participants (59.2%) were male and the majority (71.4%) were married. The most common hematologic malignancies were multiple myeloma (MM), lymphoma and myeloproliferative neoplasms (MPNs), while the most common comorbidities were hypertension, diabetes mellitus and cardiovascular disease. The median CCI score was 4 (2-8) and half of the patients (50.7%) had polypharmacy. The median ECOG-PS was 1 (0-3), this value was 6 (1-6) for ADL and 8 (0-8) for IADL. The median CFS score was 4 (0-7), which is considered "living with very mild frailty". In the evaluation of depressive symptoms, the median GDS-15 score was determined as 4 (0-12) and the median MNA-SF score for nutritional status was determined as 13 (3-14) (**Table**

1).

In the evaluations made according to gender, it was determined that the functional status determined by ECOG, ADL, IADL and the frailty status determined by CFS were at a worse level in female patients. Again, the median GDS-15 scores in female participants were found to be higher and worse compared to males [5 (0-12) vs. 3 (0-11), p=0.001]. In the evaluation made according to age groups, it was seen that the median CCI score was higher in individuals aged ≥75 [5 (3-8) vs. 4 (2-7), p<0.001]. In addition, the GDS-15 score and MNA score were also significantly worse in this group compared to the younger group (Table 1). When patients who received chemotherapy were compared to those who did not, BMI values were lower in those who received chemotherapy [25.2 (± 4.2 vs. 27.5 (± 5.6, p=0.010)] and they were using more medications. Details of the evaluation made according to gender and age groups are given in Table 1, and according to chemotherapy status

Table 1. Sociodemographic and clinical characteristics of patients regarding gender and age.

Variables	Total (n=147)	Female (n=60)	Male (n=87)	p	<75 years (n=92)	≥75 years (n=55)	p
Age, years, mean (SD)	72.5 (6.3)	72.7 (6.7)	72.4 (6.2)	0.775	68.6 (3.7)	79 (4.0)	<0.001
Gender, male, n (%)	87 (59.2)	-	-	-	57 (62.0)	30 (54.5)	0.376
Marital status, married, n (%)	105 (71.4)	32 (53.3)	73 (83.9)	<0.001	75 (81.5)	30 (54.5)	0.001
BMI,kg(m^2), mean (SD)	26.6 (5.2)	27.6 (5.5)	25.7 (4.8)	0.041	27.1 (5.0)	25.7 (5.5)	0.122
Hematological malignancies, n (%)							
Multiple myeloma	32 (21.8)	15 (25.0)	17 (19.5)	0.430	21 (22.8)	11 (20.0)	0.688
Lymphoma	30 (20.4)	8 (13.3)	22 (25.3)	0.077	18 (19.6)	12 (21.8)	0.743
Acute myeloid leukemia	10 (6.8)	5 (8.3)	5 (5.7)	0.540	8 (8.7)	2 (3.6)	0.238
Chronic lymphoid leukemia	19 (12.9)	10 (16.7)	9 (10.3)	0.261	13 (14.1)	6 (10.9)	0.577
Myelodysplastic syndrome	8 (5.4)	4 (6.7)	4 (4.6)	0.587	4 (4.3)	4 (7.3)	0.449
Myeloproliferative neoplasms	27 (18.4)	9 (15.0)	18 (20.7)	0.381	18 (19.6)	9 (16.4)	0.628
Other	21 (14.3)	9 (15.0)	12 (13.8)	0.837	10 (10.9)	11 (20.0)	0.126
Comorbidities, n (%)							
Hypertension	67 (45.6)	29 (48.3)	38 (43.7)	0.616	36 (39.1)	31 (56.4)	0.059
Diabetes mellitus	36 (24.5)	16 (26.7)	20 (23.0)	0.697	24 (26.1)	12 (21.8)	0.692
Cardiovascular disease	33 (22.4)	17 (28.3)	16 (18.4)	0.165	15 (16.3)	18 (32.7)	0.025
COPD	6 (4.1)	0 (0.0)	6 (6.9)	0.040	4 (4.3)	2 (3.6)	1.000
Cerebrovascular disease	4 (2.7)	3 (5.0)	1 (1.1)	0.305	1 (1.1)	3 (5.5)	0.148
CCI, score, median (range)	4 (2-8)	4.5 (2-7)	4 (2-8)	0.703	4 (2-7)	5 (3-8)	<0.001
Number of drugs*, median (range)	5 (0-16)	5 (0-16)	4 (0-16)	0.184	4 (0-16)	5 (0-12)	0.133
Polypharmacy*, n (%)	70 (50.7)	31 (56.4)	39 (47.0)	0.301	38 (44.2)	32 (61.5)	0.055
ECOG PS, score, median (range)	1 (0-3)	1 (0-3)	1 (0-3)	0.015	1 (0-3)	1 (0-3)	0.050
ADL, score, median (range)	6 (1-6)	5 (1-6)	6 (1-6)	0.001	6 (1-6)	6 (2-6)	0.835
IADL, score, median (range)	8 (0-8)	7 (0-8)	8 (0-8)	0.001	8 (0-8)	8 (0-8)	0.210
CFS, score, median (range)	4 (0-7)	4 (2-7)	4 (0-7)	<0.001	4 (1-7)	4 (1-7)	0.214
GDS-15, score, median (range)	4 (0-12)	5 (0-12)	3 (0-11)	0.001	3 (0-12)	4 (0-7)	0.022
MNA-SF, score, median (range)	13 (3-14)	13 (4-14)	13 (3-14)	0.189	13 (4-14)	12 (3-14)	0.028
EORTC QLQ-30, score, median (range)							
Global health status	66.7 (0-100)	66.7 (0-100)	66.7 (0-100)	0.336	66.7 (0-100)	66.7 (8.3-100)	0.050
Functional scales							
Physical functioning	73.3 (0-100)	63.3 (0-100)	80.0 (0-100)	<0.001	73,3 (0-100)	66,7 (0-100)	0.107
Role functioning	100 (0-100)	100 (0-100)	100 (0-100)	0.125	100 (0-100)	100 (0-100)	0.863
Emotional functioning	83.3 (0-100)	75.0 (0-100)	91.7 (16.6-100)	0.001	83.3 (0-100)	83.3 (0-100)	0.576
Cognitive functioning	83.3 (0-100)	83.3 (0-100)	83.3 (0-100)	0.338	73.3 (0-100)	66.7 (0-100)	0.667
Social functioning	100 (0-100)	83.3 (0-100)	100 (0-100)	0.009	100 (0-100)	83.3 (0-100)	0.449
Symptom scales							
Fatigue	33.3(0-100)	44.4 (0-100)	33.3 (0-100)	0.015	33.3 (0-100)	33.3 (0-100)	0.703
Nausea and vomiting	33.3(0-100)	0 (0-100)	0 (0-100)	0.511	0 (0-100)	0 (0-100)	0.542
Pain	16.7 (0-100)	16.7 (0-100)	0(0-100)	0.002	16.7 (0-100)	16.7 (0-100)	0.710
Dyspnea	0 (0-100)	0 (0-100)	0 (0-100)	0.858	0 (0-100)	33.3(0-100)	0.224
Insomnia	33.3(0-100)	33.3(0-100)	0 (0-100)	0.006	16.7 (0-100)	33.3 (0-100)	0.253
Appetite loss	0 (0-100)	0 (0-100)	0 (0-100)	0.653	0 (0-100)	33.3 (0-100)	0.158
Constipation	0 (0-100)	0 (0-100)	0 (0-100)	0.997	0 (0-100)	0(0-100)	0.218
Diarrhea	0 (0-100)	0 (0-100)	0 (0-100)	0.106	0 (0-100)	0 (0-100)	0.682
Financial difficulties	0 (0-100)	0 (0-100)	0 (0-100)	0.185	0 (0-100)	0 (0-100)	0.020

ADL, activities of daily living, BMI; body mass index, CCI, charlson comorbidity index CFS; clinical frailty scale, COPD; chronic obstructive pulmonary disease, ECOG PS; eastern cooperative oncology group performance scale, EORTC QLQ-30;Europeanorganizationforresearchandtreatment of cancerquality of life questionnairecore 30, GDS; geriatric depression scale, IADL; instrumental activities of daily living, MNA-SF; mini nutritional assessment-short form.*: excluding chemotherapy agents. Missing data: Polypharmacy (9), Number of drugs (9), GDS-15 (1), MNA-SF (4). Statistically significant p values are marked in bold.

are given in Table 2.

Basic Assessments Telated to the Quality of Life Scale

In the quality of life assessments made according to the EORTC QLQ-30 scale, the median global health status score of the patients was determined as 66.7 (0-100). Evaluating functional scales, it was determined that the lowest median score belonged to physical functioning [73.3 (0-100). Regarding symptoms, it was observed that the scores of fatigue, nausea and vomiting, and insomnia areas were worse [33.3 (0-100)] and this was followed by pain complaint [16.7 (0-100)] (Table 1).

In the comparison made according to gender, physical, emotional and social functioning were significantly worse in female patients than in males. Again, it was determined that fatigue, pain and insomnia complaints were higher in female patients. When evaluated by age, only financial difficulties were observed to be worse in the group under 75 years of age, while no difference was observed in other global, functional and symptom measures (Table 1). While the global health status

Table 2. Sociodemographic and clinical characteristics of patients regarding chemotherapy status.

Variables	Receiving chemotherapy (n = 86)	Not receiving chemotherapy (n = 61)	p
Age, years, mean (SD)	72.4 (6.8)	72.6 (5.5)	0.847
Gender, male, n (%)	49 (57.0)	38 (62.3)	0.518
Marital status, married, n (%)	63 (73.3)	42 (68.9)	0.560
BMI, kg (m^2), mean (SD)	27.5 (5.6)	25.2 (4.2)	0.010
Hematological malignancies, n (%)			
Multiple myeloma	13 (15.1)	19 (31.1)	0.020
Lymphoma	25 (29.1)	5 (8.2)	0.002
Acute myeloid leukemia	2 (2.3)	8 (13.1)	0.010
Chronic lymphoid leukemia	13 (15.1)	6 (9.8)	0.347
Myelodysplastic syndrome	7 (8.1)	1 (1.6)	0.087
Myeloproliferative neoplasms	10 (11.6)	17 (27.9)	0.012
Other	16 (18.6)	5 (8.2)	0.076
Comorbidities, n (%)			
Hypertension	38 (44.2)	29 (47.5)	0.687
Diabetes mellitus	20 (23.3)	16 (26.2)	0.680
Cardiovascular disease	21 (24.4)	12 (19.7)	0.497
COPD	4 (4.7)	2 (3.3)	0.679
Cerebrovascular disease	1 (1.2)	3 (4.9)	0.168
CCI, score, median (range)	5 (2-7)	4 (2-8)	0.393
Number of drugs*, median (range)	4 (0-16)	5 (0-16)	0.008
Polypharmacy*, n (%)	36 (44.4)	34 (59.6)	0.079
ECOG PS, score, median (range)	1 (0-3)	1 (0-3)	0.749
ADL, score, median (range)	6 (1-6)	6 (1-6)	0.772
IADL, score, median (range)	8 (0-8)	8 (0-8)	0.554
CFS, score, median (range)	4 (0-7)	4 (0-7)	0.829
GDS-15, score, median (range)	4 (0-12)	3 (0-11)	0.330
MNA-SF, score, median (range)	13 (4-14)	12 (3-14)	0.056
EORTC QLQ-30, score, median (range)			
Global health status	66.7 (0-100)	62.4 (0-100)	0.013
Functional scales			
Physical functioning	66.7 (0-100)	73.3 (0-100)	0.073
Role functioning	100 (0-100)	100 (0-100)	0.388
Emotional functioning	83.3 (0-100)	91.7 (0-100)	0.079
Cognitive functioning	100 (0-100)	100 (0-100)	0.566
Social functioning	100 (0-100)	100 (0-100)	0.617
Symptom scales			
Fatigue	33.3 (0-100)	33.3 (0-100)	0.406
Nausea and vomiting	0 (0-100)	33.3 (0-100)	<0.001
Pain	16.7 (0-100)	16.7 (0-100)	0.458
Dyspnea	0 (0-100)	0 (0-100)	0.386
Insomnia	33.3 (0-100)	0 (0-100)	0.220
Appetite loss	0 (0-100)	33.3 (0-100)	0.020
Constipation	0 (0-100)	0 (0-100)	0.595
Diarrhea	0 (0-100)	0 (0-100)	0.340
Financial difficulties	0 (0-100)	0 (0-100)	0.149

ADL, activities of daily living, BMI; body mass index, CCI, charlson comorbidity index CFS; clinical frailty scale, COPD; chronic obstructive pulmonary disease, ECOG PS; eastern cooperative oncology group performance scale, EORTC QLQ-30;Europeanorganizationforresearchandtreatment of cancerquality of life questionnairecore 30, GDS; geriatric depression scale, IADL; instrumental activities of daily living, MNA-SF; mini nutritional assessment-short form. *: excluding chemotherapy agents. Missing data: Polypharmacy (9), Number of drugs (9), GDS-15 (1), MNA-SF (4). Statistically significant p values are marked in bold.

scores were observed to be worse in those receiving chemotherapy [62.4 (0-100) vs. 66.7 (0-100), p=0.013], no significant difference was found between functional scales according to chemotherapy status. Symptoms of nausea and vomiting, and appetite loss were more prevalent in those receiving chemotherapy. Details of the evaluation made regarding EORTC QLQ-30 according to gender and age groups are given in **Table 1**, and according to chemotherapy status in **Table 2**.

The Relationship Between Quality of Life and Clinical Parameters

The relationships between the parameters of EORTC QLQ-30 and other numerical clinical parameters were separately evaluated. **Table 3** contains the detailed data of this analysis. Age (except for the weak negative correlation with financial difficulties), CCI, number of drugs and BMI did not show any significant correlation with the components of quality of life. There were moderate to strong negative correlation (r=-0.336 to -0.618, p<0.001) between CFS and ECOG scores and global health status and all functional parameters. This correlation persisted with symptom parameters and was weak to moderate (r=0.180-0.360), but it was not significant for dyspnea and diarrhea symptoms. There was a moderate to strong positive associations (r=0.302-0.628, p<0.001) between other functional assessment tools, ADL and IADL, and all global health status and functional parameters. These correlations continued negatively weakly and moderately with symptom variables, while there were no significant associations between ADL and appetite loss and constipation. MNA-SF was observed to have a positive weak to moderate relationship with other functional parameters, except for global health status and cognitive functioning. When symptoms and nutritional status were evaluated, MNA-SF scores had a positive weak to moderate link with fatigue, nausea and vomiting, insomnia, appetite loss, and constipation. The GDS-15 scale, which evaluates depressive symptoms, showed the highest correlation with physical functioning as a very strong negative

Table 3. Correlation of clinical parameters with EORTC QLQ-30subscales.

EORTC QLQ-30		Age	CCI	BMI	CFS	ECOG PS	ADL	IADL	MNA-SF	GDS-15
Global health status	r	0.122	0.045	-0.005	-0.370**	-0.336**	0.302**	0.352**	0.289**	-0.500**
	p	0.140	0.584	0.957	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Functional scales										
Physical functioning	r	-0.129	-0.050	-0.093	-0.527**	-0.618**	0.561**	0.583**	0.394**	-0.725**
	p	0.120	0.549	0.295	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Role functioning	r	-0.016	0.050	0.035	-0.483**	-0.546**	0.546**	0.628**	0.372**	-0.622**
	p	0.850	0.549	0.697	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Emotional functioning	r	-0.011	0.068	-0.056	-0.340**	-0.337**	0.449**	0.388**	0.187*	-0.718**
	p	0.890	0.412	0.531	<0.001	<0.001	<0.001	<0.001	0.026	<0.001
Cognitive functioning	r	-0.053	0.089	-0.048	-0.389**	-0.362**	0.402**	0.404**	0.162	-0.467**
	p	0.528	0.284	0.591	<0.001	<0.001	<0.001	<0.001	0.054	<0.001
Social functioning	r	-0.038	0.077	0.030	-0.493**	-0.500**	0.538**	0.578**	0.412**	-0.669**
	p	0.645	0.353	0.735	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Symptom scales										
Fatigue	r	0.023	0.007	0.075	0.376**	0.347**	-0.311**	-0.353**	-0.316**	0.552**
	p	0.783	0.929	0.399	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nausea and vomiting	r	-0.064	-0.035	-0.083	0.238**	0.191*	-0.255**	-0.253**	-0.292**	0.221**
	p	0.438	0.676	0.348	0.004	0.022	0.002	0.002	<0.001	0.007
Pain	r	-0.001	-0.027	0.153	0.257**	0.317**	-0.366**	-0.365**	-0.243**	0.508**
	p	0.988	0.742	0.084	0.002	<0.001	<0.001	<0.001	0.004	<0.001
Dyspnea	r	0.109	0.102	0.164	0.159	0.153	-0.247**	-0.223**	-0.134	0.294**
	p	0.188	0.217	0.064	0.056	0.066	0.003	0.007	0.111	<0.001
Insomnia	r	0.074	-0.014	-0.031	0.310**	0.360**	-0.369**	-0.372**	-0.315**	0.462**
	p	0.370	0.866	0.731	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Appetite loss	r	0.105	-0.120	-0.141	0.193*	0.183*	-0.106	-0.185*	-0.456**	0.156
	p	0.206	0.147	0.110	0.020	0.027	0.205	0.026	<0.001	0.060
Constipation	r	-0.103	-0.114	0.090	0.177*	0.180*	-0.094	-0.188*	-0.200*	0.261**
	p	0.212	0.171	0.308	0.033	0.030	0.261	0.023	0.017	0.001
Diarrhea	r	-0.029	-0.051	0.003	0.104	0.089	-0.242**	-0.177*	-0.006	0.201*
	p	0.730	0.541	0.974	0.213	0.287	0.003	0.034	0.943	0.015
Financial difficulties	r	-0.229**	-0.080	0.126	0.294**	0.326**	-0.262**	-0.303**	-0.090	0.357**
	p	0.005	0.335	0.154	<0.001	<0.001	0.001	<0.001	0.286	<0.001

ADLs, activities of daily living, BMI; body mass index, CCI; Charlson comorbidity index CFS; clinical frailty scale, ECOG PS; eastern cooperative oncology group performance scale, EORTC QLQ-30; Europeanorganizationforresearchandtreatment of cancerquality of life questionnairecore 30, GDS; geriatric depression scale, IADLs; instrumental activities of daily living, MNA-SF; mini nutritional assessment-short form.
*: Correlation is significant at the 0.05 level. **: Correlation is significant at the 0.01 level. Statistically significant p values are marked in bold.

correlation (r=-0.725, p<0.001), while it was found to have strong or very strong negative connections (r=-0.467 to -0.718) with global health status and all other functional variables. Depressive symptoms showed a strong positive correlation (r=0.552, r=0.508) with fatigue and pain at the same time, it was moderately correlated with insomnia (r=0.462). While this relationship continued to be observed as weak or moderate positive with other symptoms, no significant relationship was observed only between appetite loss and GDS-15 (**Table 3**).

The analyses evaluating the relationships between clinical parameters are given in the **Supplement Table**.

DISCUSSION

This cross-sectional study aimed to enhance the limited literature in this field by examining the connection between the quality of life and clinical parameters in elderly patients with hematological malignancies. According to the findings, moderate and strong significant positive correlations were found between EORTC QLQ-C30 global health status and all functional parameters (ECOG, CFS, ADL, IADL). This relationship was negative with ECOG and CFS, while it was positive between ADL and IADL. In terms of symptoms, it was determined that most symptoms were positively correlated with ECOG and CFS, and weakly to moderately negatively correlated with ADL and IADL. MNA-SF score was positively correlated with all functional parameters except cognitive function and global health status, and as expected, it was also observed to be associated with most symptom parameters. GDS-15 was significantly correlated with all quality of life sub-parameters except appetite loss. When the quality of life scores were evaluated in general, the lowest functional score was seen in the physical function area, while the most common symptoms were fatigue, nausea, vomiting and insomnia. Female patients scored lower in terms of physical, emotional and social functioning compared to male patients; fatigue, pain and insomnia were more common in this group. Global health status was found to be worse in patients receiving chemotherapy, but no significant difference was observed in terms of functional scales. Nausea, vomiting and loss of appetite rates were found to be higher in this group. The most common hematological malignancies in the study were multiple myeloma, lymphoma and myeloproliferative neoplasms, and the polypharmacy rate was found to be 50.7%. It was found that the burden of comorbidities and depressive symptoms were higher and nutritional status was worse in patients over the age of 75. The findings show that a multidisciplinary focus on clinical parameters is required, especially to optimize the quality of life in elderly patients with hematological malignancies.

The most striking finding in our study is that the deterioration in all functional clinical parameters is observed to be correlated with the decrease in the quality of life of the patients. While detailed scales such as the EORTC QLQ-C30 are frequently employed to identify quality- of-life-related issues, their application in clinical practice can be time-consuming and may not be feasible for routine use with every patient. Therefore, clinical tools that can predict this quickly and easily are important. In our study, the “global health status” determined by EORTC QLQ-C30 and all “functional scales” showed a significant medium-strong negative correlation with ECOG and CFS scores. Therefore, clinical tools that can predict this quickly and easily are important. In our study, the “global health status” determined by EORTC QLQ-C30 and all “functional scales” showed a significant medium-strong negative correlation with ECOG and CFS scores. Similarly, significant medium-strong positive correlations were found between ADL and IADL scores and global health status and other functional parameters. In the literature, studies on hematological malignancies have also shown that poor performance status determined by ECOG and dependency on daily living activities show a significant decrease in quality of life index scores (17). These results show that maintaining daily living activities and independence are of critical importance in improving quality of life. In addition, the existence of a relationship between MNA and many parameters that can allow for the prediction of quality of life also shows that nutritional assessments can positively contribute to quality of life, especially in this group at risk for malnutrition. In addition, it is known that depressive symptoms are quite common, especially in elderly patients with malignancy (18). In our study, the negative correlation between depressive symptoms and all functional parameters suggests that interventions targeting depressive symptoms, particularly in this patient group, could enhance quality of life.

When symptom scores were evaluated, certain symptoms showed stronger correlations with some functional and clinical assessment scales. Fatigue, nausea and vomiting, pain and insomnia are symptoms that appear to be correlated with all functional parameters we evaluated in our study, together with MNA-SF and GDS-15. The significant symptom burden associated with hematological malignancies may adversely impact these patients’ ability to carry out daily living activities, resulting in more pronounced functional losses. In addition, nutritional deficiencies and depression may exacerbate these symptoms and cause serious decreases in quality of life. The strongest correlation with symptoms was observed with depressive symptoms scored with GDS-15. Depressive symptoms showed a strong positive correlation with fatigue and pain (r=0.552, r=0.508), while they were moderately correlated with insomnia

(r=0.462). The synergistic effect of pain and insomnia symptoms with depressive symptoms is especially seen in elderly individuals. This suggests that psychological deterioration may increase symptom perception. The literature has shown that depressive symptoms have a negative impact on quality of life in patients with malignancy (19). A study conducted with lymphoma patients also showed that quality of life improved when depressive symptoms decreased (20). Likewise, it can be anticipated that malnutrition may exacerbate the symptom burden in this patient group, while enhancing nutritional status may help alleviate this burden. These findings suggest that a holistic approach to managing functional, psychological, and nutritional conditions could enhance the quality of life for patients.

Our EORTC QLQ-C30 data show that female patients have lower physical, emotional and social function scores than male patients. The symptoms of fatigue, pain and insomnia, which are also more common in female patients, may be closely related to the impairments in these areas of functionality. It is frequently emphasized in the literature that women experience symptoms such as pain and fatigue more intensely and that the impact of these symptoms on daily living activities is more pronounced (21). In addition, previous studies have shown that women have worse quality of life scale scores than men (22). These findings suggest that women are more sensitive to hematological malignancies and treatment processes, and highlight the need for multidisciplinary psychosocial support for this patient group. It is also noteworthy that there is no significant difference in functional and symptomatic parameters between age groups.The fact that expected functional declines were not observed in the older age group suggests that younger patients (65-75 years old) also face similar health problems and that the effects of hematological malignancy on general health may be related to disease burden rather than age. These findings indicate that advanced age may be a less significant determinant of quality of life than previously anticipated. Similar to our findings, It has been found that the quality of life of elderly patients with hematological malignancies is more affected by their diseases than their chronological age (23,24). The importance of chronological age was found to be significant in comparisons between young and geriatric ages. While no differences were noted in functional parameters among patients receiving chemotherapy, the increased prevalence of specific symptoms such as nausea, vomiting, and loss of appetite may be linked to treatment-related side effects. These symptoms are well-documented side effects of chemotherapy and are frequently reported as among the most common in the literature (25). Interestingly, patients who received chemotherapy exhibited similar results in functional parameters compared to those who did not receive chemotherapy, but they reported lower scores on questions related to general health status. This difference may stem from the psychosocial burden associated with chemotherapy treatment. The duration of the treatment process, challenges in managing side effects, and uncertainty regarding the treatment outcomes may contribute to a decline in patients' overall well-being. These findings highlight the potential burden and psychological effects that chemotherapy can have on patients and highlight the importance of supportive measures accompanying treatment in this patient group.

In our study, the most common hematological malignancies in this patient group include multiple myeloma, lymphoma and myeloproliferative neoplasms; this situation is parallel to the available data in the literature (5). The identification of polypharmacy in over half of the participants (50.7%) may exacerbate the challenges that elderly individuals encounter in managing their health and treatment processes.The high frequency of polypharmacy in elderly hematology patients necessitates the use of multiple medications to cope with chronic disease burden, cancer treatment side effects and comorbidities. However, this situation may complicate the treatment management of patients by increasing the risk of drug-drug interactions and drug side effects (26). In comparisons between genders, female patients were observed to exhibit worse functional status and higher depressive symptom scores than males. This disadvantaged situation of female patients may be due to biological, hormonal differences and higher levels of vulnerability, while the depressive symptoms may be associated with factors such as lack of social support and loneliness (27). Comparing genders, it was found that female patients had worse functional status and higher depressive symptom scores than males. Female patients may face a disadvantageous situation due to biological and hormonal differences, as well as higher levels of vulnerability. Factors such as lack of social support and loneliness may contribute to the higher prevalence of depressive symptoms. Polypharmacy, gender differences, and the increasing health issues in older age groups need to be addressed comprehensively manner for elderly hematology patients according to these findings.They emphasize the significance of prioritizing the health management of this patient population.

Our study has some limitations and strengths. Due to its cross-sectional design, it is not possible to determine causal relationships. Furthermore, the single-center study restricts the generalizability of the results. The subjective evaluation of quality-of-life indices and their reliance on patient perception are common limitations of these scales and are also present in our study. Lastly, it lacks long-term results on the relationship between quality of life subparameters and clinical evaluations. On the other hand, the fact that our patient population consists of elderly malignant individuals reflecting real clinical practice makes the results in the relevant patient group valuable. A detailed examination of the relationships

between clinical parameters and quality of life is one of the strengths of our study. The clinical interventions we found can be utilized to enhance the quality of life of elderly hematology patients and provide guidance for large-scale studies using advanced prospective designs.

CONCLUSION

our study demonstrates that the quality of life in elderly patients with hematological malignancies is affected by many clinical factors. These findings emphasize the importance of comprehensive clinical assessments and the need for multidisciplinary approaches to improve patient's quality of life. Optimization of quality of life in elderly patients requires individualization of clinical decisions and prioritization of symptom management. Future studies should focus on examining the long-term effects of these relationships.

DECLARATIONS

Ethics Committee Aproval: The study was conducted with the approval of the Non-Interventional Clinical Trial Ethics Committee (Date: 14.03.2024, IRB no: 2024-03/27).

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Supplement Table. Correlation of clinical parameters with EORTC QLQ-30subscales.

Clinical parameters		Age	CCI	BMI	CFS	ECOG PS	ADL	IADL	MNA-SF	GDS-15
Age	r	-	0.467**	-0.126	0.073	0.117	-0.093	-0.173*	-0.172*	0.145
	p	-	<0.001	0.154	0.383	0.160	0.267	0.038	0.040	0.080
CCI	r	0.467**	-	0.016	-0.027	-0.017	0.069	0.028	0.082	0.016
	p	<0.001	-	0.861	0.743	0.842	0.407	0.736	0.333	0.844
BMI	r	-0.126	0.016	-	-0.150	-0.153	0.051	0.173	0.438**	-0.056
	p	0.154	0.861	-	0.092	0.084	0.567	0.050	<0.001	0.530
Number of drugs	r									
	p									
CFS	r	0.073	-0.027	-0.150	-	0.815**	-0.576**	-0.699**	-0.501**	0.580**
	p	0.383	0.743	0.092	-	<0.001	<0.001	<0.001	<0.001	<0.001
ECOG PS	r	0.117	-0.017	-0.153	0.815**	-	-0.621**	-0.745**	-0.502**	0.586**
	p	0.160	0.842	0.084	<0.001	-	<0.001	<0.001	<0.001	<0.001
ADL	r	-0.093	0.069	0.051	-0.576**	-0.621**	-	0.808**	0.356**	-0.541**
	p	0.267	0.407	0.567	<0.001	<0.001	-	<0.001	<0.001	<0.001
IADL	r	-0.173*	0.028	0.173	-0.699**	-0.745**	0.808**	-	0.496**	-0.594**
	p	0.038	0.736	0.050	<0.001	<0.001	<0.001	-	<0.001	<0.001
MNA-SF	r	-0.172*	0.082	0.438**	-0.501**	-0.502**	0.356**	0.496**	-	-0.377**
	p	0.040	0.333	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001
GDS-15	r	0.145	0.016	-0.056	0.580**	0.586**	-0.541**	-0.594**	-0.377**	-
	p	0.080	0.844	0.530	<0.001	<0.001	<0.001	<0.001	<0.001	-

Abbreviation: ADLs, activities of daily living, BMI; body mass index, CCI; Charlson comorbidity index CFS; clinical frailty scale, ECOG PS; eastern cooperative oncology group performance scale, EORTC QLQ-30; Europeanorganizationforresearchandtreatment of cancerquality of life questionnairecore 30, GDS; geriatric depression scale, IADLs; instrumental activities of daily living, MNA-SF; mini nutritional assessment-short form.
*: Correlation is significant at the 0.05 level. **: Correlation is significant at the 0.01 level. Statistically significant p values are marked in bold.