

The Socio-Demographic and Clinical Factors Associated with Quality of Life among Patients with Haematological Cancer in a Large Government Hospital in Malaysia

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Abstract

Background: The paper examined the quality of life of haematological cancer patients according to their socio-demographic profiles and clinical diagnoses.

Methods: This cross-sectional study was conducted at the tertiary referral centre of Ampang Hospital, Kuala Lumpur, involving 105 patients. The European Organisation for Research and Treatment of Cancer Quality of Life (EORTC QLQ-C30) questionnaire was used to measure their quality of life.

Results: The study involved patients diagnosed with all types of haematological cancer, including non-Hodgkin lymphoma (NHL), acute myelogenous leukaemia (AML), acute lymphoblastic leukaemia (ALL), Hodgkin lymphoma (HL), and multiple myeloma (MM), with a response rate of 83.3%. The patients with ALL, HL, without NHL, and without MM were younger than other patients. There were significant differences in quality of life scores in different socio-demographic groups and types of cancer diagnosis. The global quality of life of the female patients was much better than that of the male patients. Patients who were 40 years old or younger had a better global quality of life and physical functioning, as well as fewer symptoms of constipation, nausea, and vomiting. Employed patients were in less pain but showed greater impairments of cognitive function than did unemployed patients. Patients who earned a monthly wage of RM1000 or less had reduced physical function, more symptoms of pain, and more financial difficulties compared with patients who earned more. Patients with AML tended to have better physical functioning than did patients with MM, whose physical functioning was impaired. Comparatively, more symptoms of dyspnoea were found in ALL and HL patients than in other types of lymphoma. Compared with other patients, those with ALL had a greater loss of appetite, and other lymphoma patients had fewer symptoms of pain. Patients with NHL had impaired role functioning and more constipation compared with other patients. The results were all statistically significant ($P < 0.05$).

Conclusion: The quality of life of haematological cancer patients is affected by socio-demographic factors and clinical diagnoses. Efforts should be made to improve the overall quality of life of these patients.

Keywords: haematological malignancies, leukaemia, lymphoma, multiple myeloma, oncology, quality of life, socioeconomic factors

Introduction

Nearly 7.6 million deaths due to cancer occurred globally in 2008, and as many as 12.7 million estimated cases of newly diagnosed cancer were reported worldwide (1). In Malaysia, cancer is classified as a major health problem (2), with an estimated annual incidence of 30 000 cases (3). A total of 21 773 patients

from peninsular Malaysia were diagnosed with cancer (4).

Haematological cancers include leukaemia, lymphoma and myeloma (5). In peninsular Malaysia, lymphoma is 1 of the 10 most frequent cancers among all individuals (3.2%) and among women (2.4%). Lymphoma (4.2%) and leukaemia (3.6%) are among the top 10 most frequent among men (4).

Published studies (6,7) provide detailed descriptions of the quality of life among haematological cancer patients; however, these studies were primarily conducted in Western populations. The quality of life may vary according to the type of the haematological cancer diagnosis (7); thus, there is a need to examine the quality of life of Malaysian haematological cancer patients with respect to their clinical cancer diagnoses and socio-demographic factors. To the best of our knowledge, there are no studies on this topic in Malaysian haematological cancer patients.

The aim of the present study was to describe the quality of life scores of patients in a large Malaysian hospital and compare them by different socio-demographic factors and haematological cancer diagnoses: acute myelogenous leukaemia (AML), acute lymphoblastic leukaemia (ALL), Hodgkin lymphoma (HL), non-Hodgkin lymphoma (NHL), and multiple myeloma (MM).

Subjects and Methods

This cross-sectional study was performed at a tertiary referral centre for cancer at Ampang Hospital, Kuala Lumpur, Malaysia. The sampling population consisted of haematological cancer patients admitted to ward 7A (male ward) and 7B (female ward). Each ward had 28 beds, composing a total 56 beds available for study sampling. Approximately 1391 patients were admitted to the wards in 2009. Between January and October 2009, 710 male patients were admitted; 681 female patients were admitted between January and December 2009. The admitted patients were treated for various blood system diseases, such as haematological cancers. The study period was between May and December 2009. Consecutively admitted haematological cancer patients were included if they had a confirmed haematological cancer diagnosis; spoke English, Malay, Mandarin or Tamil; were at least 15 years old; and were in a conscious state and able to complete the questionnaire. The questionnaire was distributed after mutual consent for participation in the study was obtained from the patient. Clinical and socio-demographic profiles were retrieved from the patients' and the hospital's medical records. Approval for the study was obtained from the Ethical Committees, Ministry of Health, and the Faculty of Medicine and Health Sciences, University Putra Malaysia.

The European Organisation for Research and Treatment of Cancer Quality Of Life Questionnaire (EORTC QLQ-C30) is a disease-specific questionnaire administered to cancer

patients. The questionnaire, which evaluates the quality of life, has been validated in Malay (8), the national language of Malaysia. Studies showed that the Malay-version of the questionnaire was suitable for worldwide use by Malay-speaking patients (8). Questionnaires in other languages, namely English (9), Mandarin, and Tamil (10) were also used in this study.

The 30 questions in the questionnaire comprise 5 functional scales that measure physical, role, cognitive, emotional, and social functioning; 5 symptoms scales that measure fatigue, pain, and nausea or vomiting; 1 global health status scale; and a 6 single-item scale that measures dyspnoea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties. The questions were rated on a scale of 4 points: "Not at all", "A little", "Quite a bit", or "Very much". Global health status was rated on a 7-point numbered scale that ranged from "Very poor" to "Excellent" (11). Each scale was given its own total score that ranged 0–100 and was computed from the raw scores and transformed linearly by referring to the EORTC QLQ-C30 scoring manual. Higher scores represent better functioning and better global health status, except in the symptom and single-item scales, for which higher scores are indicative of more symptoms (11).

The SPSS version 17.0 (SPSS Inc., Chicago, IL) was used in the study. Non-parametric statistical tests such as the Mann-Whitney U test were used to compare 2 variables and to determine the level of significance using a one-tailed test ($P < 0.05$). The non-parametric tests were performed because the sample sizes for some groups were small (less than 30). The one-tailed test was used for statistical comparison of groups. The use of the one-tailed test is a study limitation, as the chance for a significant P value (less than 0.05) is greater with the one-tailed test.

Results

Of the 126 patients screened, 105 patients were included in the study (response rate of 83.3%). Exclusion occurred for the following reasons: 6 patients refused to give consent; 13 patients were diagnosed with non-cancerous haematological diseases; and 2 patients had language-barrier problems.

Of the patients, 52.4% were female. Diagnosed haematological cancers included NHL (23.8%), AML (22.9%), ALL (14.3%), HL (10.5%), MM (5.7%), other lymphoma (12.4%), other leukaemia (9.5%), and histiocytosis (1.0%). Ethnic groups included Malays (60.0%), Chinese

(24.8%), Indians (13.3%), and others (1.9%). The socio-demographic and clinical characteristics of respondents are shown in Table 1.

The mean age of the patients was 40.4 years (range 15–78 years). The mean age of male patients, 43.6 years, was significantly higher compared with the female patients, 37.5 years ($t = 1.991$, $df = 103$, $P = 0.049$). Table 2 shows the age comparison based on mean rank in different disease diagnoses. The mean rank age of ALL patients, 38.67 years, was lower compared with non-ALL patients, 55.39 years ($P = 0.025$). The HL patients were also younger compared with

other patients, at 26.00 years versus 56.16 years ($P = 0.001$). In contrast, the NHL and MM patients were older than the other patients, at 65.08 years versus 49.23 years ($P = 0.012$) and 81.83 years versus 51.25 years ($P = 0.009$), respectively.

Table 3 shows between-group differences in the quality of life mean rank score as a function of socio-demographic profiles among the haematological cancer patients. The global quality of life of female patients, mean rank score of 59.70, was significantly better compared with male patients, mean rank score of 45.63 ($P = 0.009$). In age counterparts, patients

Table 1: Socio-demographic and clinical characteristics of respondents

Characteristics	n (%)
Age	
≤40 years	53 (50.5)
>40 years	52 (49.5)
Gender	
Female	55 (52.4)
Male	50 (47.6)
Occupation status	
Working	35 (33.3)
Not working	70 (66.7)
Total monthly income household	
≤ RM1000	31 (44.3)
> RM1000	39 (55.7)
Haematological cancer diagnosis	
Acute myelogenous leukaemia	24 (22.9)
Acute lymphoblastic leukaemia	15 (14.3)
Hodgkin lymphoma	11 (10.5)
Non-Hodgkin lymphoma	25 (23.8)
Multiple myeloma	6 (5.7)
Other leukaemias ^a	10 (9.5)
Other lymphomas ^b	13 (12.4)
Other ^c	1 (1.0)
Cancer duration	
Less than 6 months	50 (47.6)
6 months or more	55 (52.4)

^a Other leukaemias include chronic lymphocytic leukaemia (1 case), chronic myelogenous leukaemia (2 cases), acute promyelocytic leukaemia (3 cases), hairy cell leukaemia (1 case), myelodysplastic syndromes-refractory anemia with excess blast towards leukaemia (1 case), myelodysplastic syndromes- chronic myelomonocytic leukemia towards chronic leukaemia (1 case), and unclassified leukaemia (1 case). ^b Other lymphomas include peripheral T cell lymphoma (1 case), natural killer T cell lymphoma (3 cases), central nervous system lymphoma (2 cases), intravascular lymphoma (1 case), follicular transform lymphoma (1 case), and unclassified lymphoma (5 cases). ^c The remaining 1 case was of histiocytosis.

40 years or younger had better global quality of life ($P = 0.006$) and physical functioning ($P = 0.002$) scores as well as fewer symptoms of constipation ($P = 0.024$), but more symptoms of nausea and vomiting ($P = 0.031$) compared with patients who were older than 40. In addition, male patients faced more financial difficulties compared with female patients ($P = 0.041$). Patients in employment experienced less pain ($P < 0.001$), but demonstrated reduced cognitive functioning ($P = 0.018$) compared with patients who were unemployed. Patients who earned RM1000 or less monthly had reduced physical functioning ($P = 0.022$), more symptoms of pain ($P = 0.014$), and more financial difficulties ($P = 0.001$) than did patients who earned more. Other variables, such as the duration of haematological cancer, did not significantly differ with the quality of life scores (data not shown).

Table 4 represents between-group differences in the quality of life mean rank score as a function of haematological cancer diagnosis. Patients with AML had better physical functioning scores ($P = 0.001$) compared with the others, whereas MM patients had lower physical functioning scores ($P = 0.010$). Patients with ALL had more symptoms of nausea and vomiting ($P = 0.035$), dyspnoea ($P = 0.005$), and appetite loss ($P = 0.005$) compared with other patients.

HL patients also had more symptoms of dyspnoea compared with other cancer patients ($P = 0.020$). In contrast, patients with the other types of lymphoma experienced less pain ($P = 0.006$) and had fewer symptoms of dyspnoea ($P = 0.013$) and insomnia ($P = 0.032$). The NHL patients had reduced role functioning ($P = 0.009$) and more constipation ($P = 0.009$) compared with the others.

Discussion

The present study examined the relationship between the quality of life and various socio-demographic as well as clinical factors. Female haematological cancer patients reported a much better global quality of life than did male patients. To the best of our knowledge, comparisons by gender of the global quality of life in patients with haematological cancer are difficult because there are no published articles investigating this factor. It is interesting to note that patients in employment experiences less pain compared with those who were unemployed. In addition, most of the patients with more symptoms of pain, reduced physical functioning and financial difficulties were among those who earned less than RM1000 per month. Male patients faced more financial difficulties than did female patients.

Table 2: Comparison of age based on mean rank in different disease diagnoses

Diagnosis		n	Mean Rank Age	z	P value
AML	Yes	24	47.04	-1.091	0.138
	No	81	54.77		
ALL	Yes	15	38.67	-1.969	0.025 ^a
	No	90	55.39		
HL	Yes	11	26.00	-3.108	0.001 ^b
	No	94	56.16		
NHL	Yes	25	65.08	-2.272	0.012 ^a
	No	80	49.23		
MM	Yes	6	81.83	-2.388	0.009 ^b
	No	99	51.25		
Other leukaemias	Yes	10	57.10	-0.448	0.327
	No	95	52.57		
Other lymphomas	Yes	13	62.77	-1.236	0.109
	No	92	51.62		
Other	Yes	1	65.00	-0.396	0.346
	No	104	52.88		

^a $P < 0.05$ and ^b $P < 0.01$ with Mann-Whitney U test.

Abbreviations: AML = acute myelogenous leukaemia, ALL = acute lymphoblastic leukaemia, HL = Hodgkin lymphoma, NHL = non-Hodgkin lymphoma, MM = multiple myeloma.

Table 3: Between-group differences in the quality of life mean rank score as a function of socio-demographic profiles

Factor	QOL	PF	RF	EF	CF	SF	FA	
Age								
≤40 years	60.420	61.730	57.580	50.610	55.700	54.100	48.650	
>40 years	45.440	44.110	48.340	55.430	50.250	51.880	57.430	
<i>z</i>	-2.552	-2.976	-1.610	-0.815	-0.940	-0.382	-1.491	
<i>P</i> value	0.006 ^b	0.002 ^b	0.054	0.208	0.174	0.352	0.068	
Gender								
Male	45.630	51.870	54.200	51.410	50.610	51.880	56.180	
Female	59.700	54.030	51.910	54.450	55.170	54.020	50.110	
<i>z</i>	-2.396	-0.364	-0.399	-0.513	-0.786	-0.366	-1.029	
<i>P</i> value	0.009 ^b	0.358	0.345	0.304	0.216	0.358	0.152	
Employment								
Unemployed	55.550	52.260	55.640	54.150	57.310	54.210	50.900	
Employed	47.900	54.490	47.730	50.700	44.370	50.590	57.200	
<i>z</i>	-1.230	-0.355	-1.299	-0.550	-2.105	-0.585	-1.008	
<i>P</i> value	0.110	0.362	0.097	0.291	0.018 ^a	0.280	0.157	
Monthly salary								
> RM1000	35.210	39.870	37.830	35.150	34.120	37.420	35.990	
≤ RM1000	35.870	30.000	32.560	35.940	37.240	33.080	34.890	
<i>z</i>	-0.138	-2.023	-1.140	-0.160	-0.653	-0.908	-0.277	
<i>P</i> value	0.445	0.022 ^a	0.127	0.437	0.257	0.182	0.411	
Factor	FI	NV	PA	DY	SL	AP	CO	DI
Age								
≤40 years	52.410	58.090	48.380	55.600	53.750	50.560	47.480	54.220
>40 years	53.610	47.810	57.710	50.350	52.230	55.490	58.630	51.760
<i>z</i>	-0.210	-1.868	-1.619	-1.043	-0.279	-0.866	-1.981	-0.502
<i>P</i> value	0.417	0.031 ^a	0.053	0.149	0.390	0.193	0.024 ^a	0.308
Gender								
Male	58.220	51.550	52.480	53.720	54.790	51.350	50.480	52.290
Female	48.250	54.680	53.470	52.350	51.370	54.500	55.290	53.650
<i>z</i>	-1.740	-0.641	-0.172	-0.272	-0.625	-0.522	-0.854	-0.276
<i>P</i> value	0.041 ^a	0.261	0.432	0.393	0.266	0.291	0.197	0.391
Employment								
Unemployed	54.050	51.410	61.410	51.180	52.100	52.650	51.360	54.910
Employed	50.900	56.170	36.170	56.640	54.800	53.700	56.290	49.190
<i>z</i>	-0.5190	-0.815	-4.127	-1.022	-0.466	-0.174	-0.826	-1.102
<i>P</i> value	0.302	0.208	0.000 ^c	0.154	0.321	0.431	0.205	0.136
Monthly salary								
> RM1000	28.810	37.560	30.850	35.740	36.730	35.030	32.880	37.100
≤ RM1000	43.920	32.900	41.350	35.190	33.950	36.100	38.790	33.480
<i>z</i>	-3.213	-1.035	-2.210	-0.130	-0.615	-0.228	-1.296	-0.917
<i>P</i> value	0.001 ^a	0.151	0.014 ^a	0.448	0.269	0.410	0.098	0.180

^a*P* < 0.05, ^b *P* < 0.01, and ^c *P* < 0.001 with Mann-Whitney U test.

Abbreviations: QOL = global quality of life, PF = physical functioning, RF = role functioning, EF = emotional functioning, CF = cognitive functioning, SF = social functioning, FA = fatigue, FI = financial difficulties, NV = nausea and vomiting, PA = pain, DY = dyspnoea, SL = insomnia, AP = appetite loss, CO = constipation, DI = diarrhoea.

Table 4: Between-group differences in the quality of life mean rank score as a function of haematological cancer diagnosis

Diagnosis	QOL	PF	RF	EF	CF	SF	FA	
No-AML	50.380	47.990	51.520	53.960	53.710	55.010	52.260	
AML	61.830	69.920	58.000	49.750	50.600	46.230	55.500	
z	-1.639	-3.111	-0.949	-0.598	-0.450	-1.262	-0.462	
P value	0.051	0.001 ^b	0.172	0.275	0.327	0.104	0.322	
No-MM	53.590	54.700	53.040	53.160	53.760	52.850	51.860	
MM	43.250	25.000	52.42	50.420	40.420	55.420	71.830	
z	-0.818	-2.329	-0.050	-0.215	-1.069	-0.204	-1.574	
P value	0.207	0.010 ^a	0.480	0.415	0.143	0.420	0.058	
No-ALL	53.420	52.680	52.170	52.020	52.510	52.720	53.600	
ALL	50.470	54.930	57.970	58.900	55.970	54.700	49.40	
z	-0.353	-0.267	-0.707	-0.8140	-0.418	-0.238	-0.499	
P value	0.362	0.395	0.240	0.208	0.338	0.406	0.309	
No-HL	52.130	52.800	52.450	53.450	52.710	52.930	54.450	
HL	60.410	54.730	57.730	49.180	55.500	53.590	40.590	
z	-0.864	-0.200	-0.564	-0.442	-0.295	-0.069	-1.441	
P value	0.194	0.421	0.287	0.330	0.384	0.473	0.075	
No-other lymphoma	53.770	54.420	52.890	53.220	52.360	53.520	52.570	
Lymphoma	47.540	42.960	53.770	51.460	57.500	49.310	56.040	
z	-0.700	-1.275	-0.101	-0.196	-0.584	-0.475	-0.388	
P value	0.242	0.101	0.460	0.423	0.280	0.318	0.349	
No-NHL	53.880	55.040	56.830	52.130	52.750	52.390	53.320	
NHL	50.200	46.480	40.760	55.800	53.800	54.940	51.980	
z	-0.534	-1.231	-2.385	-0.529	-0.154	-0.371	-0.194	
P value	0.297	0.109	0.009 ^b	0.299	0.439	0.355	0.424	
Diagnosis	NV	PA	DY	SL	AP	CO	DI	FI
No-AML	53.020	54.090	53.940	50.880	52.600	53.770	52.930	53.610
AML	52.940	49.330	49.810	60.170	54.330	50.400	53.250	50.940
z	-0.012	-0.692	-0.688	-1.430	-0.255	-0.504	-0.056	-0.393
P value	0.495	0.245	0.246	0.077	0.400	0.3070	0.478	0.3480
No-MM	54.080	52.590	53.060	53.420	53.400	53.060	52.440	52.980
MM	35.250	59.750	52.000	46.080	46.420	52.000	62.170	53.250
z	-1.588	-0.576	-0.098	-0.624	-0.569	-0.088	-0.922	-0.022
P value	0.056	0.282	0.461	0.267	0.285	0.465	0.179	0.492
No-ALL	49.980	52.570	50.340	52.610	50.020	53.880	51.920	52.250
ALL	71.100	55.600	68.970	55.370	70.870	47.730	59.470	57.500
z	-2.685	-0.368	-2.586	-0.354	-2.561	-0.764	-1.078	-0.642
P value	0.035 ^a	0.357	0.005 ^b	0.362	0.005 ^b	0.223	0.141	0.261
No-HL	52.820	52.120	51.220	52.230	53.860	53.430	52.810	52.790
HL	54.550	60.550	68.230	59.550	45.640	49.320	54.590	54.770
z	-0.192	-0.895	-2.067	-0.820	-0.884	-0.448	-0.222	-0.212
P value	0.424	0.186	0.020 ^a	0.206	0.188	0.327	0.412	0.416
No-other lymphoma	52.860	55.760	55.130	54.900	53.730	53.400	53.020	52.770
Lymphoma	53.960	33.460	37.920	39.540	47.810	50.190	52.850	54.620
z	-0.131	-2.547	-2.249	-1.854	-0.685	-0.375	-0.024	-0.212
P value	0.448	0.006 ^b	0.013 ^a	0.032 ^a	0.247	0.354	0.491	0.416
No-NHL	54.790	50.570	55.040	53.510	52.900	49.280	53.430	52.700
NHL	47.280	60.780	46.460	51.360	53.320	64.920	51.640	53.960
z	-1.162	-1.508	-1.451	-0.336	-0.063	-2.369	-0.310	-0.188
P value	0.123	0.066	0.074	0.369	0.475	0.009 ^b	0.378	0.426

^aP < 0.05, ^bP < 0.01, and ^cP < 0.001 with Mann-Whitney U test.

Abbreviations: QOL = global quality of life, PF = physical functioning, RF = role functioning, EF = emotional functioning, CF = cognitive functioning, SF = social functioning, FA = fatigue, FI = financial difficulties, NV = nausea and vomiting, PA = pain, DY = dyspnoea, SL = insomnia, AP = appetite loss, CO = constipation, DI = diarrhoea, AML = acute myelogenous leukaemia, ALL = acute lymphoblastic leukaemia, HL = Hodgkin lymphoma, NHL = non-Hodgkin lymphoma, MM = multiple myeloma.

A possible explanation for this may be a previous finding that male cancer patients scored higher in working ability at 6 months after returning to work, but not at 12 or 18 months. Furthermore, haematological cancer patients were less able to work, leading to less overtime opportunity. The reduced ability to work was due in part to chemotherapy treatments (12).

Patients who were older than 40 years reported a reduced global quality of life and physical functioning scores and more symptoms of constipation, but fewer symptoms of nausea and vomiting compared with other patients. The ages of NHL and MM patients were significantly higher compared with other haematological cancer patients. Impaired role functioning and reduced physical functioning were found in NHL and MM patients, respectively. NHL patients also had symptoms of constipation. These findings support a recent study that reported older haematological cancer patients having a poor quality of life with more impaired physical and role functioning and more symptoms of constipation (7).

Overall, the patients with MM had the lowest mean rank score in physical functioning. This result corroborates the findings of Santos et al. (6), who reported that the physical functioning of MM patients was the most impaired compared with other haematological cancer patients. The AML patients in the current study had better physical functioning scores compared with the other patients. This result is consistent with that of a previous study and suggest that newly diagnosed AML patients have better physical functioning despite undergoing intensive chemotherapy treatment (13). The data indicate that different diagnoses of haematological cancer may have varied effects on the quality of life.

Patients diagnosed with ALL and HL had more symptoms of dyspnoea. This result is similar to that reported in a study of a mixed cancer population that included lymphoma patients (14). However, other types of lymphoma patients reported less pain, dyspnoea, and insomnia compared with other haematological cancer patients. The existence of insomnia in haematological cancer patients has been shown in a previous study (7). More symptoms of appetite loss and nausea and vomiting were noted in ALL patients compared with other patients. Symptoms such as appetite loss may have been caused by the active treatment regimens (7). Haematological cancer patients have more symptoms of pain (7). The present study found that lymphoma patients experienced significantly less pain compared with patients with other haematological cancers.

Current working ability, mental work ability, quality of life, fatigue, physical complaints, cognitive functioning, age, physical work load, work stress, gender, diagnosis, and treatment were all related to the time taken to return to work. Thus, the return to work was greatly influenced by the patients' mental and psychological factors. Interventions targeted at cancer patients should focus on their ability to return to work, particularly because no such targeted interventions presently exist (12).

These problems can be at least partly overcome by psychotherapy conducted by mental health professionals, verbally, interactively, or in combination. A variety of cognitive behavioural therapies, supportive psychotherapy, and problem-solving therapy may help to alleviate the problems faced by cancer patients (15). Clinicians may also play an important role in the detection of poor working ability among the patients to improve their quality of life (12).

The present study had several limitations. It applied a cross-sectional design; therefore, causal relationships cannot be determined. The EORTC-QOL is a self-rated questionnaire, and some parts of the questions were explained to the patients for clarification purposes. Responses depended on the patients' memory together with their emotional and physical state at the time of the study. These factors should be considered when interpreting the current results.

Conclusion

This study suggests that the quality of life of haematological cancer patients was affected by socio-demographic factors and clinical diagnoses. The study found that the youngest patients were in the ALL, HL, without NHL, and without MM groups. The younger patients (40 years or younger) had better global quality of life and physical functioning scores and fewer symptoms of constipation, but more symptoms of nausea and vomiting. The study also found that the female global quality of life was better than for the male patients. The MM patients had reduced physical functioning; the ALL patients had more symptoms of nausea and vomiting, dyspnoea and appetite loss; the HL patients had more dyspnoea symptoms; and the NHL patients had reduced role functioning and more constipation. Cost-effective psychotherapy combined with daily patient care are very important to reduce the burden of psychological distress and to improve the overall quality of life among patients with haematological cancers.

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Authors' Contributions

Conception and design : DP, AH, MZA, KN, MSS, KB

Obtaining of funding: AH

Provision of study materials or patients, collection and assembly of the data: DP, KB

Statistical expertise, analysis and interpretation of the data : DP, MSS

Drafting of the article: DP

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