

Psychosocial Dimensions for Lymphoma Patients: An Assessment Issue

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Abstract. *Background and aim of the work:* The aim of the current study was to explore under-considered psychosocial dimensions for lymphoma group. A model of the role of psychosocial factors and Stressful Life Events was operationalized. *Method:* We used Discriminant Analysis to test predictive power of the model. 103 haematologic patients (gender: 42.7 % vs 49.3 % of females 55.2 ±15.6 vs 53.7±14.9) were matched with 140 healthy control groups in the study. The following instruments were utilized to conduct the study: the Florence Psychiatric Interview, Hospital Anxiety Depression Scale, Multidimensional Scale of Perceived Social Support, Beck Depression Inventory I, and Sense of Mastery. *Results:* The model satisfied the assumption criteria and were significant ($\Lambda = .665$, $\chi^2 = 105.83$, $p < .001$). *Conclusion:* Stressful events, depression and anxiety were relevant dimensions of the psychological status of lymphoma patients. Our results point out the relevance of taking into account psychosocial factors in hematology. (www.actabiomedica.it)

Key words: Stressful life events, cancer, psychosocial factors, assessment

Background

Hodgkin and Non-Hodgkin lymphoma [Hodgkin Lymphoma and non-Hodgkin Lymphoma] are common hematologic malignancies of the immune system with a global incidence of greater than 100,000 and 500,000 annual cases worldwide, respectively (1,2).

Beyond disease and treatment-related physical consequences, lymphoma patients have reported negative psychological and economic well-being, describing decreased happiness, employment problems, depression, and other emotional symptoms (3). Prevalence of psychosocial distress, anxiety and depression among hematological cancer patients and survivors has been found to be higher than that reported by survivors of some other cancer types (4,5). However, other psychosocial dimensions can be related to distress intensity related to cancer treatment, adherence to treatment and patient's quality of life, such as the lack of social

support and low sense of mastery, other stressors (e.g., concurrent stressful life events and comorbid conditions), and individual characteristics (6–10).

Within the psycho-oncological literature, the psychosocial needs of hematologic cancer patients seem to be underestimated and undertreated (11–15), and little has been done to effectively alleviate psychosocial burden in these patients. As suggested by Bryant and colleagues (16), to improve important health outcomes and develop the best possible evidence for addressing psychosocial outcomes for hematologic cancer patients, research should firstly focus on developing sound, psychometrically robust psychosocial outcomes measures to accurately assessing the extent and nature of a problem. However, to our knowledge no previous study has developed an integrated model for the assessment of psychosocial factors (i.e., Early Life Events, Recent Life Events, depressive and anxious symptomatology, perceived social support and sense of mastery) relevant

for Hodgkin and Non-Hodgkin lymphoma [Hodjkin Lymphoma and non-Hodjkin Lymphoma] patients.

To fill up this gap, we adapt and implement a psychosocial assessment procedure (Figure 1), taking into account the psychosocial needs previously identified by cancer literature (17–19), to investigate whether they can discriminate between Hematologic cancer patients and a control group.

Aims

The aim of the current study is therefore to test a model for assessment Psychosocial Dimensions for patients suffering from hematologic cancer. Specifically, the purpose is to determine Psychosocial Dimensions relevant in haematologic sector consistent with the already consolidated literature on this general topic (7,9,10,13,14,17,20). In particular, concerning the psychosocial assessment model, this following hypothesis is to explore: psychosocial variables (depression,

stress, social support), allow to discriminate between a Haematological group and a control group. So, the main goal of the study is to propose an assessment model to catch relevant Psychosocial Dimensions of a group of patients affected by Lymphoma.

Method

Participants

A case-control study was designed. The study enrolled a consecutive series of 110 patients suffering from lymphomas admitted to the hospital ward (Section of Hematology and Bone Marrow Transplantation Unit, Careggi University Hospital, Florence, Italy), between March 2nd, 2012 and March 30th, 2013. Exclusion criteria were age < 18 and > 75 years, intellectual disability, and not fluent Italian. Of the 110 patients contacted, 7 (6.4%) refused to participate and therefore, 103 patients (59 women and 44 men) were

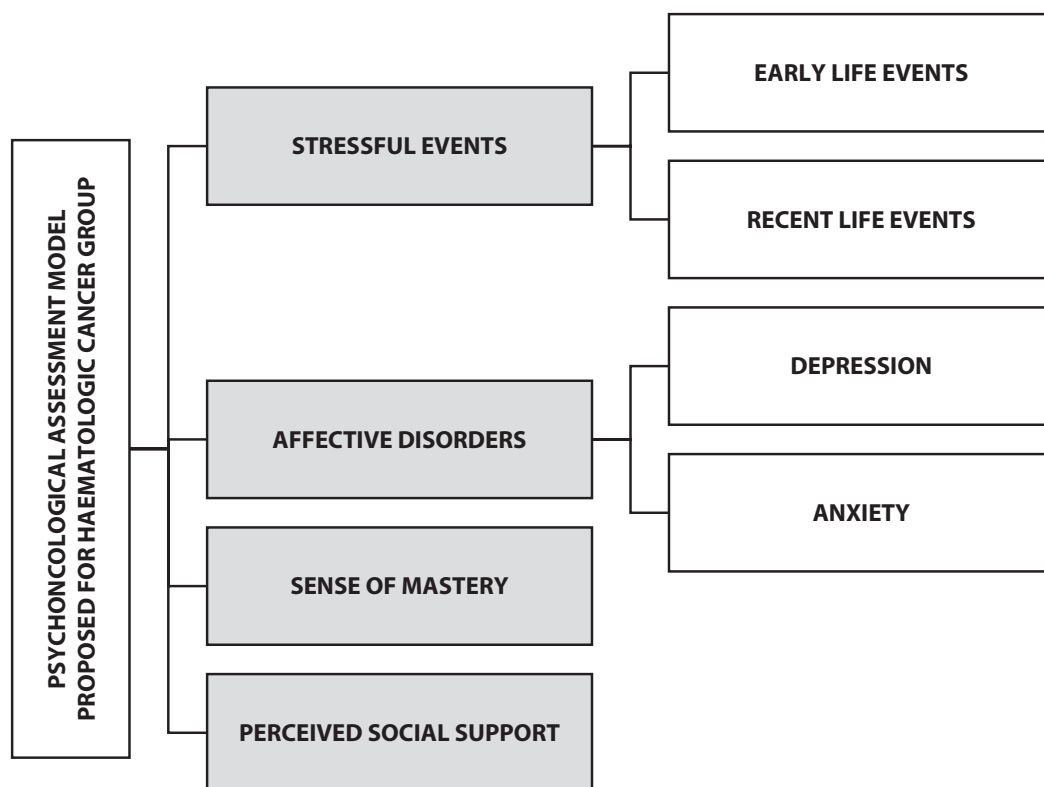


Figure 1. Psychoncological assessment model tested on haematologic cancer group.

included in the study. A group of 140 people drawn from the general population living in the same catchment area and matched for age, gender and education made up the controls. Control group was recruited by a convenience sampling (matched for age and education to the clinical group). These were randomly recruited from the regional lists of the Italian National Health System (99.7% of the citizens are included in the list of the NHS).

It was selected using a case-control method from a pool of 1077 representative subjects of the general population living in the same area (the region of Tuscany, central Italy).

The inclusion criteria for controls were being free of cancer or other malignant disease and living in the same geographical area of the clinical population (the region of Tuscany, central Italy).

As patients and control subjects were matched for sex, age and educational level, no significant differences between patients and controls were found (gender: 42.7 % vs 49.3 % of females, age: 55.2 ±15.6 vs 53.7±14.9 years old, and educational level: 10.5±4.1 vs 10.6±4.0 years of educations).

Measures

Data collection consisted of a semi-structured interview and written questionnaires filled out in a hospital setting. Socio-demographic variables and a complete medical history, including oncological diagnosis, age of onset, stage of cancer, current and past treatments (i.e., chemotherapy, radiotherapy and surgical operation) were collected. Dimensions assessed were: *Stressful Event, Anxiety, Depression, Social Support and Sense of Mastery*.

Stressful Events

To avoid a possible recall bias, only objectively verifiable Early Life Events and Recent Life Events were assessed by means of the Florence Psychiatric Interview (FPI), a fully validated, semi-structured interview (21). The following Early Life Events occurred during the first 15 years of life, and the context in which they occurred and the subject's age at the time

of occurrence were investigated: death of, or separation from, mother; death of, or separation from, father; loss and severe illness of any other cohabiting relative and severe illness in the subject's childhood sufficient to interfere with the development of normal social relationships. The interview transcripts were examined by fully qualified independent investigators, not involved in the interviews and blind to the participants' group status, who rated whether each descriptive account had to be considered a stressful event. Two composite variables were utilized: one was a *cumulative effect of the Early Life Events* (in which we included death of, or separation from mother; death of, or separation from, father; loss and severe illness of any other cohabiting relative) and the other was a *cumulative effect of Recent Life Events* (in which we included: death of mother, father, partner, loss and severe illness of any other cohabiting relative).

Anxiety, Depression, Social Support and Sense of Mastery

Resilience, anxiety and depressive symptoms, and social support were assessed using the Italian versions of the Sense of Mastery scale (SOM, seven items on a 7-point Likert scale) (22), the Hospital Anxiety Depression Scale (HADS) (23), the Beck Depression Inventory (BDI) (24) and the Multidimensional Scale of Perceived Social Support (MSPSS) (25), respectively. The Italian version of the Sense of Coherence scale (SOC, three items on a 3-point Likert scale) (26) assesses the global belief in one's ability to control things and to mitigate adverse aversive events. The scale contains seven items (e.g., "What happens to me in the future mostly depends on me") which are rated on a 7-point Likert scale with 1 meaning "Strongly agree" and 7 meaning "Strongly disagree". The total scores range from 7 to 49 with higher scores indicate a higher level of self-mastery. The Italian version of SOM showed good internal consistency (27). The HADS (23) is a 14-item self-report questionnaire on a 4-point Likert scale. The questionnaire includes depression and anxiety subscales (seven items for each). The total score ranges from 0 to 42 for all the 14 items, and each subscale (depression and anxiety) is scored from 0 to 21. The HADS is a useful self-report measure of the severity of anxiety and

depressive symptoms in somatic, psychiatric and primary care patients and in the general population (28). The HADS has shown good psychometric properties as a measure to assess depressive and anxiety symptoms in Italian samples (29). The MSPSS (25) was developed by Zimet et al. in 1988 to measure perceived social support by patients. The MSPSS assesses perceptions of three dimensions: social support adequacy from family, friends and significant others. The three scales are composed is by four items each. This 12-item scale uses a 7-point Likert type response format (1= *very strongly disagree*; 7= *very strongly agree*). A higher score indicates better perceived social support. The Italian version of the MSPSS has shown good psychometric properties (30). The BDI (24) quantitatively assesses the depressive symptoms perceived by the patient. It consists of 21 sentence groups and was independently completed by the patient. Each item is rated on a four-point Likert-type scale ranging from 0 to 3; its total score ranges from 0 to 63, with higher scores indicating more severe depressive symptoms. It explores the affective, cognitive, motivational, vegetative, and psychomotor components of depression. Each item comprises a list of four statements arranged by the increasing severity of a symptom of depression; the higher the score, the higher the severity of depressive symptoms. Excellent psychometric properties of the BDI-II on Italian individuals were found (31).

Data Analysis

The interviews were transcript and examined by qualified independent investigators, not involved in the interviews and blind to the participants' group status. They rated whether each descriptive account had to be considered a stressful event. The descriptive Statistics of the Psychosocial Variables were compared by One way ANOVA. The data file was inspected for missing data and normality of the distribution. There were no missing data and the respect of Multivariate Normality was checked by Mahalanobis distance.

In order to test hypothesis, a discriminant function (DA), was used. Discriminant Analysis (32), can be useful when a set of independent continuous variables are expected to predict an outcome that

is expressed by a categorical dependent variable; here we are interested in exploring a Discriminant Model in which the outcome variable is the Group (Haematologic Cancer vs Control Group) while a set of psychosocial and clinical variables are considered as predictors. Discriminant Analysis provides an estimate of the classification power of the overall set of predictors together with estimate of the relative contribution (weight) of each variable to the variation of the outcome. A linear combination of the predictor variables that provide the best discrimination between the groups was tested. Discriminant analysis is appropriate when wishing to predict in which group (in this paper, those who belongs to the oncological or healthy group) participants will be collocated. Our model of markers tested by DA included the Cumulative Effect of Early Life Events, cumulative effect of Recent Life Events, Anxiety scale (HADS), Depression scale (HADS), Beck Depression Inventory (BDI), Friends Social Perceived Support, Family Social Perceived Support, Others Social Perceived Support (MSPSS), and Sense of Mastery (SOM). Data were analysed using SPSS for Windows 22.0 (33).

Ethical considerations

The approval of the local Florence Ethics Committee was obtained on July, the 25th, 2011 (acceptance protocol number 2011/0027621 Ref. 70/11).

The study was designed and conducted according to the Standards for Psychological Research of the Italian Association of Psychology (34) and was conducted in accordance with introduced and authorized amendments as well as with the ethical principles of the Declaration of Helsinki. The participants were informed by the investigator on the purposes and objectives of the research and signed specific informed consent to the study and to the processing of personal data. An information note was attached to the consent, which clarified the voluntary participation in the research and the possibility of withdrawing from it at any time. The information also specified that the interview and that the data collected would be analyzed and disclosed in a strictly anonymous form.

Table 1. Descriptive Statistics of the Psychosocial Variables (Hematologic Group vs Control Group) (One way ANOVA)

	Oncological group			Control group			F	p
	Mean	Std. deviation	Std.Error	Mean	Std. deviation	Std.Error		
Cumulative Effect Early Life Events	1.27	1.14	.11	.23	.49	.06	45.81	<.01
Cumulative Effect Recent Life Events	.35	.55	.05	.09	.30	.04	10.63	<.01
Anxiety Scale HADS	6.9	3.6	.36	3.85	1.83	.23	37.1	<.01
Depression Scale HADS	7.52	3.17	.31	3.44	1.75	.22	85.40	<.01
Beck Depression Inventory BDI	7.41	7.72	.76	1.57	2.48	.31	32.79	<.01
Friends Social Perceived Support	4.94	1.68	.16	5.86	.98	.12	15.51	<.01
Family Social Perceived Support	5.64	1.47	.14	6.19	.82	.10	7.24	<.01
Others Social Perceived Support	5.91	1.36	.13	6.39	.79	.10	6.28	<.01
Sense Of Mastery	32.25	8.59	.84	38.36	6.43	.82	23.14	<.01

Results

The descriptive and comparison between the Hematologic group and the control group (One Way ANOVA) for psychosocial variables was showed in Table 1.

The mean score of stressful events (Early Life Events $m= 1.27$ and Recent Life Events $m= 0.35$), affective symptoms when assessed by HADS (anxiety $m= 6.09$ and depression $m=7.52$), and BDI $m= 7.41$ was higher in the clinical group, while sense of mastery $m= 32.25$ and Perceived Family Social Support $m=5.64$ were lower than control group. All comparison above mentioned were statistically significant ($p < .01$).

Discriminant analysis revealed that Wilks' lambda was significant: $\Lambda = .665, \chi^2 = 105.83, p < .001$, indicating that the model including these nine variables was able to significantly discriminate between the two groups. Figure 2 presents the standardized function coefficients of the model. Adequate Variable (i.e., with a score higher than $|\ .30|$) are six: *Cumulative Effect of Early Life Events, Depression Scale HADS, Beck Depression Inventory, Others support, Family Support and Friend Support*. Those variables seem to contribute most in distinguishing between those who belonged to the clinical group and those who did not, using these predictors. The standardized Function coefficients in the Figure 2 indicate their respectively values 0.61, 0.38, 0.35, -0.36, -0.42, -0.43. Those scores allow us to consider those variables as adequate markers of the model tested.

The classification results (Figure 3) show that the model correctly predicts 63.9 % of those who belonged to the clinical group.

Some limitations of the present study must be acknowledged. The retrospective and cross-sectional design of the study obviously introduces the possibility of a recall bias caused by cancer diagnosis or memory distortion, as patients re-evaluate their lives based on their health state and might selectively recall their experience before the diagnosis. For these reasons, only objectively verifiable early events were assessed as loss and separation. A larger sample and a more detailed investigation are therefore necessary to confirm the psychological discriminant factors on haematological cancer and to evaluate other factors that may modulate the response to traumatic childhood events (e.g., temperament, attachment, and parental style).

Discussion

In accordance with previous findings (17), almost all the clinical participants in the present study reported more psychosocial needs and stressful events (7,9,11–15,20,35–37) than healthy control subjects.

Previous empirical findings have shown that stressful life events and psychosocial problems (e.g., depression, anxiety, and low social support), predispose oncological patients to psychological distress and negative outcomes (6–10,38). In the present study, the discriminant analysis was performed to verify the

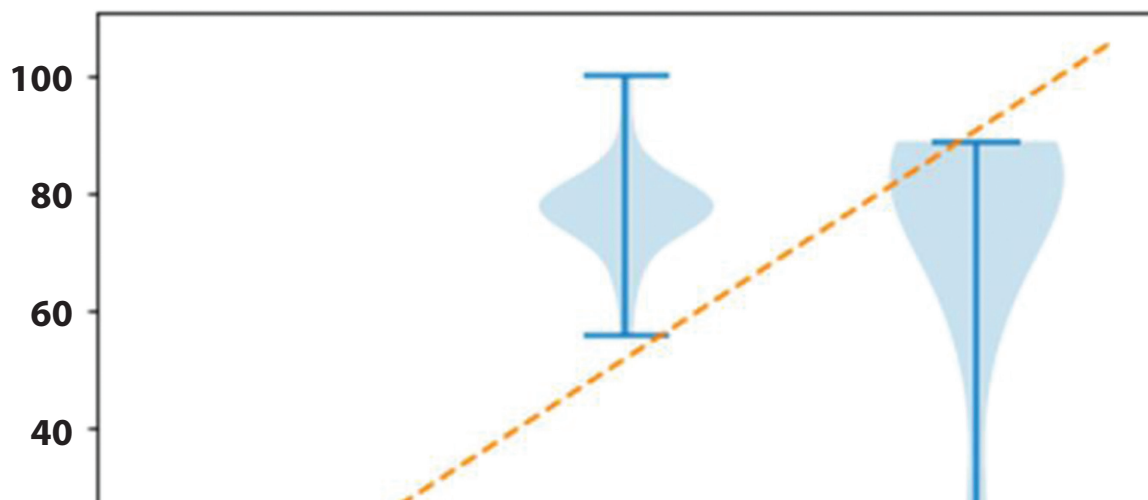


Figure 2. Standardized Function Coefficients of the model.

Note. **Standardized** Discriminant Coefficients of the final discriminant function that separates out the Haematologic group (n = 103) from the Control group (n= 140). Standardized Discriminant Coefficients are the equivalent of beta weights in regression. Good predictors tend to have large values of the Standardized Discriminant Coefficients. In particular valid predictors (named Adequate Variables) are variables showing a Standardized Discriminant Coefficient higher than |.30|. In this model, adequate Variables are: Cumulative Effect of Early Life Events, Depression Scale HADS, Beck Depression Inventory, Others support, Family Support and Friend Support. Black Columns represent the variables able to discriminate

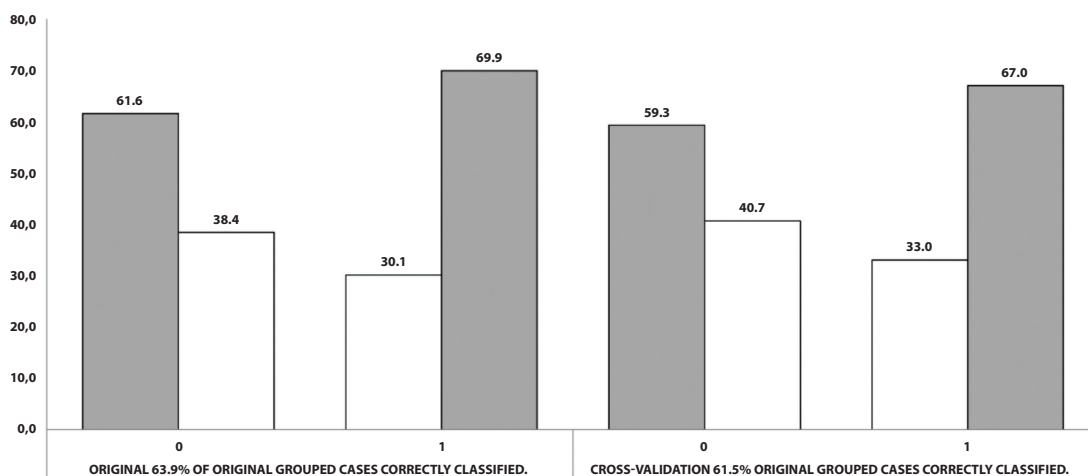


Figure 3. Classification of those who belonged to the clinical group in model

Note. **The** validity of Discriminant Analysis is tested by contrasting the power to discriminate provided by the Discriminant Model with a chance classification: reclassification of the Hematologic Cancer Group (n= 103) and of the Control Group (n= 140) obtained with the Discriminant Model. On the left we have reported the “improvement over chance criterion” (IOCC), showing that about 69.9% of the Hematologic Cancer patients are correctly reclassified by the Discriminant Function (gray bar, left). On the right re-classification is obtained with the cross-validation procedure. It is described as a ‘jack-knife’ classification, in that it successively classifies all cases but one to develop a discriminant function and then categorizes the case that was left out. This process is repeated with each case left out in turn. This cross validation produces a more reliable function. Here the difference between the results obtained with the two methods is minimal, as more than 67.7% of the Hematologic cancer patients are correctly reclassified with cross-validation (gray bar, left). Both procedures detect a valid discriminative power for the Model

hypothesis that the variables in the model can be considered an adequate marker for a discriminant function; thus, the plausibility of the postulated discrimination among groups was tested. The model was able to correctly allocate around 63.9 % of the subjects to the groups. Markers that are more adequate were especially those represented by stressful events, depressive symptomatology and social support dimensions. This result is in line with the findings from previous studies that underline high level of psychological distress in lymphoma sample (6–10,38).

Hence, these results indicate that several components, such as adverse life events and psychosocial variables (depression and social support), can explain the psychological condition of oncological patients. A possible explanation for this result suppression effect might explain this finding as cancer patients' perception of social support and depressive symptoms are strongly inter-related (39). Moreover, whereas previous studies suggest that social support from significant others work as a buffer against reaction to stressful live events. On the other hand: *Anxiety* dimension and *Recent Life Events* seems to be not relevant in our model. Probably anxiety circuit activation was less peculiar than depressive symptomatology for haematology patients.

Practical implications

Our results are congruent with the clinical observations of several studies (6–10,40), confirming the need to consider specific psychosocial needs among Haematology cancer patients. Identifying patients at particularly high risk for psychological adjustment difficulties represents an important step toward designing interventions tailored for different groups (11,13,15,41). Therefore, our results point out the importance of an accurate assessment procedure of psychosocial factors for Lymphoma patients. Specifically, our findings suggest the consideration on assessment procedure of four dimensions: stressful Early life events, Depression Symptoms assessed by HADS (23) and Depression assessed by BDI instrument. So, patients with an history of Early life events and high level of depression could be treated also with a psychotherapy approach.

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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