

Personality (at Intrapsychic and Interpersonal Level) Associated With Quality of Life in Patients With Cancer (Lung and Colon)

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Abstract

The objective of this study was to determine the association of quality of life (QoL) and intrapsychic and interpersonal behaviors (Structural Analysis of Social Behavior [SASB]) of patients with cancer (lung: $n = 88$; age 62.8 ± 10.1 ; colon: $n = 56$; age 60.1 ± 11.4). Personality described by SASB clusters (CIs): SASB-Questionnaire; QoL tests: FACT_G and QLQ-C30. Patients with lung cancer ($n = 88$; age 62.8 ± 10.1) and colon cancer ($n = 56$; age 60.1 ± 11.4 ; all stages of severity). Multiple regression analyses. Multiple linear regression: dependent variable: FACT_G; covariates: physical functioning, cognitive functioning, SASB-CI3-50°, SASB-CI6-50°. Analysis of variance and t test confirm validity of the model ($P < .001$). SASB-CI3 with FACT_G ($P = .034$); SASB-CI6 with FACT_G ($P = .002$); age with FACT_G ($P = .018$); physical functioning with FACT_G ($P < .001$); cognitive functioning with FACT_G ($P < .001$). Personality traits such as self-critical and oppressive behaviors, low capacity for self-esteem, physical and cognitive functioning, and age (a higher age determines a better QoL) strongly determine QoL in patients with lung and colon cancer. This may suggest areas of therapeutic intervention.

Keywords

personality, intrapsychic behavior, interpersonal behavior, quality of life, colon cancer, lung cancer, psychotherapy

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Introduction

Lung and colon or colorectal cancer (LC and CRC) are the major causes of morbidity and mortality, particularly in the developed world.¹ Lung tumor is the most common neoplasia in both men and women after breast cancer in Europe, although improvements in early detection and treatment have slowly increased survival rates over recent decades.¹⁻⁵ Colorectal cancer is the third most common cancer worldwide and the fourth leading cause of cancer mortality.⁶

Health-related quality of life (HRQoL) is a construct reflecting the impact of health on overall well-being.^{2,7,8} According to the World Health Organization (WHO), HRQoL is determined by the interplay of dimensions such as physical health, psychological state, level of independence, social relationships, and

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relationship with the salient features of the environment (WHOQOL Group 1993).^{2,7,8}

As HRQoL has been shown to be an important predictor of survival,^{2,3,9} the appraisal of this dimension could be very helpful for clinical decision-making and patient management.⁷ Many dimensions of HRQoL are predictors of better health outcomes,^{2,5,10,11} such as greater psychological well-being (ie, feeling happy, capable, well-supported, and satisfied with life). In addition, HRQoL has shown to be negatively correlated with depression.^{12,13}

According to the biopsychosocial model of health, personal beliefs and actions affect the health of the individual.¹⁴ This model sees the illness through the co-presence of various factors associated with greater or lesser strength in the individual: social, cognitive, behavioral, cultural, and racial variables. All these factors play an important role in modulating the personal “unpleasant experience.”

In a review, Kaptein et al¹⁵ report that in many studies on the QoL in patients with cancer, the physiological aspect has been given great importance. In fact, in the different stages of the disease, the variables that can determine the QoL seem to be more related to psychosocial factors than to symptoms and anticancer therapies. The assessment of the patient’s QoL based mainly on physiological functioning refers to a biomedical model in which the social and psychological aspects are neglected. Since HRQoL is linked to the personal perception of experience, goals, aspirations, and individual values, it is not possible to ignore the consideration that QoL is largely determined by factors related to the individual’s personality and not only by external objective factors.¹⁶

Psychosocial factors, including personality, may modulate the process of adaptation to disease conditions and its side effects. Moreover, for some authors, they may contribute to cancer onset.^{14,17-20} A common explanation for this is that immune inflammatory and neuroendocrine pathways may mediate the influence of personality dimensions and psychological distress upon carcinogenesis and tumor progression.^{14,20-22} The subsequent pain, sleeping difficulties, and fatigue may be further aggravated by pain-associated maladaptive coping modalities and negative pain beliefs, each likely influenced by personality.^{2,11,13,23} In addition, these responses in themselves may influence aspects of personality in a vicious circle of mutual influence.^{22,24-27}

In this framework, individual personality plays an important role as well.²⁸⁻³⁰ Personality refers to an individual’s enduring and pervasive personal motivation, emotion, interpersonal style, attitudes, and behaviors that are stable over a long time after young adulthood. In relation to cancer, the personality traits have already been investigated.³¹ Even after developing the disease, type D personality is a vulnerability factor³²⁻³⁴ that may identify subgroups of cancer survivors³⁵ who are at an increased risk for comorbidity burden and increased health-care utilization.^{23,36,37} Type D personality is determined by the presence of 2 personality traits: “negative affectivity” (the tendency to experience negative emotions) and “social inhibition,” defined as the ability to inhibit self-expression in social

interaction. Generally, individuals who report high scores in negative affectivity also show a greater tendency to experience negative emotions. On the contrary, individuals who have a higher score in social inhibition also show a tendency not to manifest these emotions, as a consequence of fear of being rejected or disapproved by others.³⁸

Type D personality has also been found to be at independent risk for impaired HRQoL.^{25,30,35,38-40} Indeed, personal reactions to disease represent individual integrations of emotions and beliefs. So intrapsychic behaviors of the structure of personality, linked to anxiety and depression, are common in patients with cancer.^{35,37}

Personality differences in individuals may be important in the above context and beyond clinical characteristics and can determine the capacity or incapacity of adaptation to the disease conditions.^{35,37,39-41}

It is reasonable to assume that a good QoL is correlated with more satisfactory intrapsychic and interpersonal processes of the structure of personality.^{35,37,41}

Therefore, having a good understanding of such psychological dynamics may contribute to implement preventive treatments and improve survival and QoL in patients with cancer.^{41,42}

So far, several studies have examined the association of coping styles, social networks, and social support with QoL in patients with cancer,^{24,42} but few have examined this relationship together with personality at intrapsychic and interpersonal behaviors^{26,43,44} and few in LC and CRC.

There are several approaches to conceptualizing personality. In this study, we implemented the Structural Analysis of Social Behavior (SASB) model by Critchfield and Benjamin,⁴⁵ where personality dimensions at intrapsychic level account for a large part of the variations in personality (from normal to pathological). It is a well-validated model for describing interpersonal and intrapsychic interactions in ways that are useful in clinical settings as well as in research: in clinical settings for diagnosing, planning, and verifying psychotherapeutic intervention.

Our hypothesis is that good intrapsychic and interpersonal behaviors allow the patients to approach the challenges of life’s difficulties with a sense of meaning and consequently favor the adaptation to disease.

In this research, we examine QoL in the framework of interpersonal and/or intrapersonal (intrapsychic) processes of the personality structure.^{35,36,43,45,46} If our study hypothesis is confirmed, it will be possible to apply psychotherapeutic interventions directed to support patients in clinical practice to cope with cancer.^{42,45,46}

The objective of this study is to determine the association of QoL and intrapsychic and interpersonal behaviors of patients with LC and CRC. In particular, we tried to identify intrapsychic and interpersonal modalities and psychological vulnerabilities and we investigated the role that intrapsychic and interpersonal modalities play in preserving positive QoL.

This may reveal a source of strength and may suggest areas of therapeutic intervention. Moreover, our outcome would

Table 1. Description of the Sample.

| | Lung Cancer, n = 88 | Colon Cancer, n = 56 | Total, n = 144 | P Value |
|------------------------|---------------------|----------------------|----------------|---------|
| Gender | | | | |
| Male | 40 (45.5%) | 27 (48.2%) | 67 (46.5%) | .746 |
| Female | 48 (54.5%) | 29 (51.8%) | 77 (53.5%) | |
| Age | 62.8 ± 10.1 | 60.2 ± 11.4 | 61.7 ± 10.7 | .147 |
| Marriage status | | | | |
| 1 = Single | 4 (4.7%) | 6 (10.9%) | 10 (7.1%) | .406 |
| 2 = Married | 62 (72.9%) | 41 (27.3%) | 103 (73.6%) | |
| 3 = Widowed | 8 (9.4%) | 3 (5.5%) | 11 (7.9%) | |
| 4 = Separated/divorced | 11 (12.9%) | 5 (9.1%) | 16 (11.4%) | |
| Educational level | | | | |
| 1 = Primary school | 1 (1.2%) | 0 (0.0%) | 1 (0.7%) | .863 |
| 2 = Middle school | 2 (2.5%) | 1 (1.9%) | 3 (2.2%) | |
| 3 = Secondary school | 39 (48.1%) | 27 (50.0%) | 66 (48.9%) | |
| 4 = University | 39 (48.1%) | 26 (48.1%) | 65 (48.1%) | |
| SASB-C11 | 31.6 ± 17.0 | 32.7 ± 13.7 | 32.0 ± 15.7 | .694 |
| SASB-C12 | 67.7 ± 17.3 | 70.0 ± 16.1 | 68.6 ± 16.9 | .415 |
| SASB-C13 | 60.4 ± 20.1 | 68.4 ± 19.0 | 63.5 ± 20.0 | .018 |
| SASB-C14 | 65.8 ± 19.7 | 70.8 ± 17.4 | 67.7 ± 18.9 | .127 |
| SASB-C15 | 57.1 ± 16.8 | 56.7 ± 21.9 | 56.9 ± 18.9 | .913 |
| SASB-C16 | 10.6 ± 14.7 | 7.4 ± 11.0 | 9.3 ± 13.4 | .163 |
| SASB-C17 | 9.0 ± 14.5 | 8.3 ± 11.5 | 8.7 ± 13.4 | .744 |
| SASB-C18 | 17.3 ± 14.2 | 15.1 ± 13.9 | 16.5 ± 14.1 | .359 |
| Physical functioning | 73.0 ± 21.6 | 73.6 ± 38.0 | 73.2 ± 28.9 | .908 |
| Cognitive functioning | 79.2 ± 21.6 | 81.5 ± 27.5 | 80.1 ± 24.0 | .571 |

support the idea of global care, involving the personality area in addition to the medical one.

Methods

Setting

This cross-sectional study was conducted at INRCA-IRCCS National Institute of Science and Health for Aging and at the Oncology Clinics of the “Ospedali Riuniti,” Polytechnic University of Marche. Patients attending the Oncology Clinics were invited to participate in the study. The research project was accepted by the Ethical Committee of both institutions.

Participants

Patients affected by LC (n = 88; [age 62.8 ± 10.1] and CRC [n = 56; age 60.1 ± 11.4; all stages [S]] of severity—lung: first stage, 28%; second stage, 35%; third stage, 23%; fourth stage, 14%; colon: first stage, 23%; second stage, 35%; third stage, 27%; fourth stage, 15%) were chosen because these diseases are common and the therapy is standardized (Table 1). We expected a minimum variation in the type of chemotherapy.

Patients with all cancer stages were recruited after institutional review board approval. All of them had undergone a biopsy procedure for the histological diagnosis of cancer. All patients were at the first diagnosis for CRC and/or LC. The patients of both groups had started chemotherapy from 2 to 5 months.

Age and demographic data including marital status and educational levels were collected (Table 1).

Inclusion criteria for participation were adult and older patients, with diagnosis of LC or CRC for whom chemotherapy was planned; patients who were currently receiving treatment for both metastatic disease or adjuvant chemotherapy or had received chemotherapy in the past, even if they had not received it for at least 1 year; and patients' willingness to sign informed consent. Exclusion criteria were patient's unwillingness to participate; patients with Eastern Cooperative Oncology Group performance status >1; inability to provide informed consent or to fill the study forms (eg, due to fatigue); having received chemotherapy during the past year, but not currently receiving treatment; and previous history of malignancy, with the exception of nonmelanomatous skin cancers.

All participants were approached in the clinic by the physician and asked to fill out and sign the consent form, if they decided to participate. They were free to complete the questionnaire either in the clinic or at home. Patients electing to complete forms at home were given a self-addressed, stamped envelope to return the forms. One hundred and seventy-three patients decided to participate and fill out and sign the consent form. Twenty-nine patients didn't answer all the questions in the questionnaires: It was, therefore, decided not to consider them for the analysis.

Measurement

All participants were asked to complete the following psychological and psychosocial tests:

1. Social schedule, including data on gender, age, marital status, educational level, profession, and diagnosis;
2. SASB Form-A by Critchfield and Benjamin^{45,46} that describes psychic processes of the personality structure at the intrapsychic and interpersonal level (Online Appendix A). It was chosen because of its brevity and has the appropriate reliability and validity to evaluate intrapsychic processes of the structure of personality from normal to pathological and is validated on the basis of *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition and on the Italian population. Structural Analysis of Social Behavior is a model that can be used to assess interpersonal and intrapsychic interactions in terms of 3 underlying dimensions: focus (other, self, introject), affiliation-hostility (love-hate), and interdependence-independence (enmeshment-differentiation). This test describes the actual experience of the participants examined. Interviewed participants had to respond to 36 items in the questionnaire, describing their intrapsychic behaviors during the last year (eg, “I neglect myself, don’t try to develop good skills, ways of being”; “I practice and work on developing worthwhile skills, ways of being”; “I think up ways to hurt and destroy myself. I am my own worst enemy”). The SASB Form-A questionnaire describes the structure of personality from normal to pathological.

The 36 questions provide an exhaustive picture of intrapsychic experience and are rated on a 10-point scale (from 0 = never to 10 = all the time). The 36 questions of Form-A are grouped by a specific score correction in 8 clusters (C1) of intrapsychic “Oneself” and interpersonal “Other” experience. The clusters of “Oneself” and “Other” are complementary: A modality of interpersonal experience corresponds to an intrapsychic experience and vice versa (respectively, C11 and C15; C12 and C16; C13 and C17; C14 and C18; high levels in C11, C12, C13, and C14 correspond to low levels, respectively, in C15, C16, C17, and C18).

The 8 clusters of Oneself intrapsychic behaviors:
 SASB-C11 = Autonomy-Assertive and separating
 SASB-C12 = Autonomy and love-Self-accepting and exploring
 SASB-C13 = Love-Self-supporting and appreciative
 SASB-C14 = Love and control-Self-care and development
 SASB-C15 = Control-Self-regulating and controlling
 SASB-C16 = Control and hate Self-critical and oppressive
 SASB-C17 = Hate-Self-refusing and annulling
 SASB-C18 = Hate and autonomy-Self-negligent and mentally absent

3. FACT-Quality of Life.⁴⁷ This scale has all the requirements, including reliability and validity for use in oncology clinical trials. Subscales are Physical-Well-Being (PWB), Social-Well-Being (SWB), Emotional-

Well-Being (EWB), Functional-Well-Being (FWB), and General-Summary-Score (FACT_G).

4. QLQ-C30-Quality of Life.^{48,49} This scale has all the requirements, including reliability and validity for use in oncology clinical trials. Subscales are Physical Functioning (PF2), Role-Functioning (RF2), Emotional-Functioning (EF), Cognitive Functioning (CF), Social-Functioning (SF), Fatigue (FA), Nausea-Vomiting (NV), Pain (PA), Dyspnea (DY), Insomnia (SL), Appetite Loss (AP), Constipation (CO), Diarrhea (DI), Financial-Difficulties (FI), and Global Health Status.

Sample Size Calculation

Calculation of the sample size is based on the correlation between FACT_G and the QLQ-C30 scales in patients with cancer, assuming a size effect, $\delta = .26$. Using G-Power software (version G*Power 3.1.9.2) software, we calculated the effect size, assuming a total of 144 participants, a power of 95%, and an α of .05. This effect size is generally recognized as medium and can be considered adequate to our study since just like in the paper by Kemmler et al,⁴⁹ we obtain a correlation coefficient $r = 0.85$.

Statistical Analysis

Demographic variables and all psychometric scales are presented as mean \pm standard deviation or as percentages within specific ranges. We considered FACT_G as study variable. We transformed the 8 SASB variables (continuous form) into dichotomic variables in which the median of the distribution of each variable divides the same variables into 2 categories (high and low). The SASB variables were dichotomized at the 50th percentile of the distribution in the studied sample as the most appropriate discrimination of the high and low dimensions of SASB CIs.

Pearson coefficient was used to assess correlation between dichotomized SASB variables and other determinants of quality variables. Significance was accepted as $P < .005$.

To examine the relationship between FACT_G and possible predictors, a multiple regression analyses was conducted.

The results are presented as the P value of the single independent variables, β , meant as the measure of variation in FACT_G, for every unit of independent variable variation. The validity of the model is confirmed by the analysis of variance test, which is significant ($P < .001$).

All analyses were performed using SPSS for Windows, version 19.0.

Results

No differences for sex, age, civil status, and educational level emerged for the groups of patients with CRC and LC (Table 1).

The overall FACT_G was chosen as the studied variable.

We considered the following QoL dimensions for our analysis: Quality of life-FACT and its subscales: PWB, SWB,

Table 2. Reliability Statistics.

| Items | Cronbach α |
|-----------------------|-------------------|
| Physical-functioning | .790 |
| Role-functioning | .809 |
| Emotional-functioning | .772 |
| Cognitive-functioning | .792 |
| Social-functioning | .765 |
| Global-health-status | .769 |
| Physical-well-being | .788 |
| Social-well-being | .798 |
| Emotional-well-being | .794 |
| Functional-well-being | .786 |
| General-summary-score | .766 |
| Total score | .756 |
| asci1_50 | .802 |
| asci2_50 | .801 |
| asci3_50 | .801 |
| asci4_50 | .801 |
| asci5_50 | .802 |
| asci6_50 | .802 |
| asci7_50 | .802 |
| asci8_50 | .802 |

EWB, FWB, FACT_G; Quality of Life-QLQ-C30 and its subscales: PF2, RF2, EF, CF, SF, FA, NV, PA, DY, SL, AP, CO, DI, FI, and QLQ-C30 Total.

The dichotomic variables were constructed on the basis of the 50th percentile of the SASB intrapsychic behaviors CIs: SASB-C11_50° (Autonomy); SASB-C12_50° (Autonomy-love); SASB-C13_50° (Love); SASB-C14_50° (Love-control); SASB-C15_50° (Control); SASB-C16_50° (Control-hate); SASB-C17_50° (Hate); and SASB-C18_50° (Hate-autonomy) to identify the patients who show high or low values in these CIs. All these variables are reliable (Cronbach $\alpha > .75$; Table 2).

Correlation was made between FACT_G and some determinants of the QoL (QLQ-C30) and 8 SASB binary variables created before.

From the correlation, it emerged that SASB C11, C12, C13, C16, C17, C18, and all the QLQ-C30 variables are correlated with FACT_G (Table 3).

As reported in Table 1, from the comparisons analysis between CRC and LC groups on the SASB variables (continuous form), only a significant difference in SASB C13 emerged (means: lung 60.4; colon 68.4, $P = .019$). Patients with CRC have higher levels in the intrapsychic dimensions described in this CI than those with LC. No significant difference emerged in SASB C11, C12, C14, C15, C16, C17, and C18. In PF and CF, no significant differences between the 2 groups were found.

We then proceeded to the elimination of possible multicollinearity of the variables (the study of correlations), from which the following variables emerged as dependent variables to be included in the model: total quality of life-FACT_G, Physical-Functioning (PF-QLQ-C30), Cognitive-Functioning (CF-QLQ-C30), SASB-C13_50°, and SASB-C16_50°.

Table 3. Correlations Between FACT_G and QLQ-c30 and Binary SASB Variables.

| Variables | Pearson Coefficient r |
|-----------------------|-------------------------|
| asci1_50° | -0.167 ^a |
| asci2_50° | 0.382 ^b |
| asci3_50° | 0.216 ^a |
| asci4_50° | 0.066 |
| asci5_50° | -0.107 |
| asci6_50° | -0.383 ^b |
| asci7_50° | -0.404 ^b |
| asci8_50° | -0.301 ^b |
| Physical-functioning | 0.405 ^b |
| Role-functioning | 0.423 ^b |
| Emotional-functioning | 0.710 ^b |
| Cognitive-functioning | 0.428 ^b |
| Social-functioning | 0.556 ^b |
| Global health status | 0.656 ^b |
| Physical-well-being | 0.723 ^b |
| Social-well-being | 0.517 ^b |
| Emotional-well-being | 0.725 ^b |
| Functional-well-being | 0.898 ^b |
| Total score | 0.964 ^b |

Abbreviation: SASB, Structural Analysis of Social Behavior.

^a $P < .05$.

^b $P < .01$.

Multiple Linear Regression

At this point, we finally come to the multiple linear regression model where the dependent variable is represented by FACT_G (continuous form) while covariates are represented by sex, age, PF-QLQ-C30, CF-QLQ-C30, SASB-C13-50°, and SASB-C16-50° (Table 4).

According to this model, the FACT_G is directly proportional (significantly) to the following variables: age, PF, CF, and SASB-C13_50°.

In inverse proportion to the increase in SASB-C16_50°, FACT_G variable decreases, and with the decrease in SASB-C16_50° FACT_G variable increases.

The t test confirms the validity of the model ($P < .001$).

Structural Analysis of Social Behavior Intrapsychic Behaviors and QLQ

SASB C13 determines FACT_G ($\beta = .147$; $P = .034$).

SASB C16 determines FACT_G ($\beta = -.223$; $P = .002$).

Structural Analysis of Social Behavior Interpersonal Behaviors and QLQ

SASB C13 determines FACT_G ($\beta = .147$; $P = .034$).

SASB C16 determines FACT_G ($\beta = -.233$; $P = .002$).

Age determines FACT_G ($\beta = .170$; $P = .018$).

Physical functioning, CF, and FACT_G

Physical functioning determines FACT_G ($\beta = .393$; $P < .001$).

Cognitive functioning determines FACT_G ($\beta = .275$; $P < .001$).

Table 4. Coefficients.

| Model | Nonstandardized Coefficients | | Standardized Coefficients | Confidence Interval 95% for β | | | |
|-----------------------|------------------------------|----------------|---------------------------|-------------------------------------|---------|-------------|-------------|
| | β | Standard Error | β | t | P Value | Lower Limit | Upper Limit |
| (Constant) | 36.305 | 8.960 | | 4.052 | .000 | 18.577 | 54.033 |
| Gender | 1.150 | 2.099 | .038 | 0.548 | .585 | -3.002 | 5.303 |
| Age | 0.231 | 0.096 | .170 | 2.404 | .018 | 0.041 | 0.422 |
| Physical functioning | 0.203 | 0.037 | .393 | 5.541 | .000 | 0.131 | 0.276 |
| Cognitive functioning | 0.172 | 0.044 | .275 | 3.877 | .000 | 0.084 | 0.259 |
| SASB CI3_50° | 4.386 | 2.043 | .147 | 2.146 | .034 | 0.343 | 8.428 |
| SASB CI6-50° | -6.651 | 2.098 | -.223 | -3.170 | .002 | -10.803 | -2.499 |

Abbreviation: SASB, Structural Analysis of Social Behavior.

A higher PF corresponds to a high QoL FACT_G.
 Low CF corresponds with a low FACT_G, while high
 CF corresponds with a good QoL.

Discussion

This study examined the influence of personality traits on the QoL of patients with cancer. Results revealed how personality traits contribute to the QoL process. Patients with LC and CRC with higher scores in intrapsychic dimensions SASB-CI3 and lower scores in SASB-CI6 show a higher QoL (FACT_G) than that of patients without these intrapsychic dimensions. In fact, patients with cancer with the lowest score in SASB-CI3 and the highest score in SASB-CI6 have a low QoL: patients with LC and CRC who presented a low capacity for self-esteem, low ability to take care of and reconsolidate themselves (CI3; low expression of spontaneity and flexibility), and incur in self-critical and oppressive behaviors have a bad QoL (CI6; SASB-CI3 and SASB-CI6 on FACT_G). In the SASB profile, it emerged that these intrapsychic dimensions are concomitants of anxiety and depression.

These underlying personality characteristics are significant concomitants of a poor QoL²⁵ and may hamper the patients' ability to adapt themselves in receiving antineoplastic treatment.

Patients who are able to take care of and reconsolidate themselves with self-esteem (CI3) and do not to incur in self-critical and oppressive behaviors (CI6) are able to maintain a good QoL.

Some studies affirm that a neurotic personality is especially promising with regard to its relationship to the phenomenology and outcome of anxiety influencing QoL.^{25,43,50} Furthermore, the results of multivariate linear regression of the present study supported our hypothesis that intrapsychic behaviors have a greater impact on QoL in patients with cancer. So our results agree with the consideration that the ability to adjust to the cancer experience is impacted not only by medical treatments but also by relational and intrapsychic characteristics of the individual.^{23,25}

Anxiety is reportedly associated with how patients cope with and adjust to threats, and it is well known that individuals with these traits are more likely to be self-critical.⁴³ On the other hand, the importance of self-critical behavior has not

been well documented, and our result of patients manifesting low QoL provides new insight. Moreover, some studies showed that in patients with cancer, low capacity for self-esteem and self-criticism are related to low acceptance of the disease and may result in anxiety.^{26,43}

Our results may indicate that low QoL, and intrapsychic behaviors, may be related to nonacceptance of the disease and its conditions.

So patients with problematic intrapsychic behaviors could be regarded as having a high risk of bad QoL and could be followed up and screened.

As a clinical implication of this finding, crisis intervention including provision of adequate information, emotional support, symptom control, and so on may be needed for many patients in order to overcome the problems related to cancer and to improve QoL. An intensive multifocal rehabilitation program could be developed for patients with cancer, especially for younger ones.^{25,42} When developing psychosocial interventions for patients with cancer, it is therefore essential to consider the relevance of intrapsychic behaviors that influence interpersonal behaviors.

Moreover, it is within the context of interpersonal relationships that optimal emotional adjustment to cancer can be addressed. At interpersonal levels (interpersonal behaviors), the results of the present study are the following: a low capacity of taking care of, being attentive, and being close to the other people. These patients are described as belittling, blaming, or manipulating the other in a deceitful way and these interpersonal behaviors are associated with a bad QoL (SASB-CI6 on FACT_G).

The interpersonal behaviors of caring, consoling, and desiring to be close to the other person (CI3) are associated with a good QoL. Behavior patterns that may also be present include treating the other justly and listening to the person attentively even if there are differences of opinion (CI6).

Compared to psychological factors, the contribution of personal characteristics such as age, PF, and CF on QoL emerged.

Low PF and CF determine a low QoL (PF and CF on FACT_G).

Higher PF determines a high QoL FACT_G.

Synthesizing some personality traits, PF, CF and age play a significant role in determining QoL in patients with LC and CRC, with younger patients having a worse QoL.

The presence of intrapsychic behaviors is described and their weight on QoL is highlighted.

Further prospective studies are needed to confirm these results.

Our study indicates that knowledge of the intrapsychic profile and the other dimensions that emerged may be important for the following reasons:

1. Knowledge of intrapsychic modalities may be a marker of patients with a bad adaptation to cancer treatment and to avoid complications.
Patients with negative intrapsychic behaviors should undergo closer cancer surveillance.
2. The presence of adequate intrapsychic modalities may favor a positive adaptation to the treatment of cancer. It may also favor the QoL by improving natural defenses. They may be a marker for a better adaptation to the disease condition.

Patients with these negative intrapsychic behaviors (especially self-critical behavior) incurring in bad QoL should undergo closer cancer surveillance. Younger patients need more surveillance.

The clinical implication of these data concerns the need for many patients to be able to use crisis intervention, including the screening of intrapsychic behaviors, the control of symptoms, and the need to receive adequate information.

The limitations of the present study are as follows: First, all the participants were patients with LC and CRC, and attention is required when generalizing these outcomes to other illnesses; second, our outcomes offer a representation of intrapsychic behaviors and QoL both after cancer diagnosis and during the trajectory or care. Psychological distress and QoL in the post-diagnosis period are generally correlated to the follow-up period, but results may differ throughout the treatment phase or at other points in the trajectory of the disease. In addition, we do not have enough data on the precise interval of time from the LC and CRC diagnosis. Quality of life may change over time once patients begin therapies, and the present outcomes may be appropriate to different settings.^{25,44} We were also unable to compare patients with different degrees of severity due to the limited number.

Further studies are therefore necessary to address these objectives.

Which Psychotherapy?

The ability to adjust to the cancer experience is impacted not only by medical treatments but also by relational and intrapsychic characteristics of the individual and we agree with this consideration.

Based on the intrapsychic profile (SASB) which emerged, specific psychotherapeutic interventions could be necessary⁴⁶ for facilitating contact, self-awareness, and elaboration and integration of emotional experiences (passive adaptation, low self-affirmation, self-criticism), in order to change the life style

and encourage resources necessary for a successful adaptation to the disease condition. So we hypothesize that a psychotherapeutic treatment for changing maladaptive intrapsychic behaviors could contribute to decreasing depression and stress and to improving QoL.

When developing psychosocial and psychotherapeutic interventions for patients with cancer, it is therefore essential to consider the relevance of intrapsychic behaviors that influence the interpersonal behaviors. It is within the context of these interpersonal relationships that optimal emotional adjustment to cancer can be addressed.¹⁴

An understanding of the complex neurobiological, psychological, and social causes of the somatization disorder, in order to improve diagnostic accuracy and therefore the capacity to develop a treatment plan tailored to the needs of each patient, is essential. So our results suggest to make an accurate psychological diagnosis of personality.

Once significant anxiety, depression, and problematic intrapsychic behaviors are detected in patients with cancer, some psychotherapeutic intervention like, for example, cognitive-behavioral therapy and/or holistic psychotherapy with mindfulness (mindfulness-based stress reduction [MBSR]) to change maladaptive intrapsychic behaviors could be desirable.^{51,52}

As an element of psychosocial support, spirituality is included in the Holistic Psychotherapeutic Approach, which may play a role in the treatment outcome of diseases. The bio-psycho-spiritual (holistic) model is focused on the entire personality and personal consciousness and looks at the illness through the co-presence of various factors associated with greater or lesser strength in the individual. Stress, anxiety, depression, beliefs, and cultural meanings attributed to pain, personal strategies in response to pain (active or passive), self-awareness (spirituality), degree of self-esteem, mood, and situations of fear-frustration are all important situations in the individual. Holistic psychotherapy is an integrated bio-psycho-spiritual approach that includes different kinds of psychotherapies, especially Therapeutic Psychosynthesis and Bio-Psychosynthesis.

Given the effectiveness of more or less short interventions with MBSR, we propose an integrated holistic psychotherapy (Therapeutic Psychosynthesis, Bio Psychosynthesis, Symbolic Jungian work with body involvement, Transpersonal Psychology) with mindfulness, hypothesizing that such psychotherapeutic treatment can be effective to obtain a better QoL stable over time in patients with cancer.

Several studies from transpersonal psychology underline 2 central functions originating from the practice of awareness (spiritual practice mindfulness): One is centering on a dimension of oneself, achieving a state of concentration, relaxation, and silence (observer-transpersonal psychology), the other is based on the capacity to observe one's own psychic contents without judgment. This allows to become aware of one's own psychic content and to take action on one's involvements (including psychic contents and intrapsychic conflict).

In synthesis, mindfulness has been suggested to be effective via 4 mechanisms: attention regulation, body awareness, emotion regulation, and changes in perspective on the self.⁵³⁻⁵⁵ Most of the studies in this field showed the effectiveness of mindfulness-based cognitive therapy, but evaluation was made after 3 months of training and few studies control the data in the long run.

Through mindfulness practice, the patient learns to pay attention without effort to contents, in a nonjudgmental way. The underlying emotional experience thus emerges for a re-elaboration and awareness raising. Through holistic psychotherapy, the patient is able to contact, re-elaborate, and integrate the intrapsychic contents and conflicts.^{46,56} The consequence of the re-elaboration of underlying intrapsychic conflicts is the discovery of the real needs as a fundamental step of psychotherapy.⁴⁶

A final consideration: Given the intrapsychic problems that emerged such as excess of self-control and criticism, depression, and their influence on the QoL in patients with cancer, we hypothesize that an intervention with holistic psychotherapy and mindfulness cannot be short (3 months) for the most problematic patients, above all if it is to be effective over long periods in a lasting way.

Authors' Note

The authors confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. The authors further confirm that the order of authors listed in the manuscript has been approved by all of us. The authors confirm that we are given due consideration to the protection of intellectual property associated with this work and there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing, the authors confirm that we are followed the regulations of our Institutions concerning intellectual property. The ethical permission was applied. Ethics Committee- INRCA-IRCCS National Institute of Science and Health for Aging Study: ST/10/271 bis (Prot. 649). The authors understand that the Corresponding Author is the sole contact for the Editorial process (including Editorial Manager and direct communication with the office). He/she is responsible for communicating with the other authors about progress, submission of revisions and final approval of proofs. The authors confirm that we have provided a current, correct email address which is accessible by Corresponding Author and which has been configured to accept e-mail from: a.vespa@inrca.it.

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Supplementary Materials

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