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Are social support and coping styles differently associated with adjustment to cancer in early and advanced stages?

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Abstract

Background: Many people experience cancer as a chronic disease followed by adaptation to a new reality. Adjustment to cancer is a continuous process that follows the progression of the disease. Aims: We aimed to support the claim that patients in different stages of cancer develop different adjustment patterns, and that the stage of the disease modifies the interrelationships among social support, coping styles, and quality of life. We also hypothesized that greater perceived social support influence more adaptive coping strategies, which mediate the relationship between social support and adjustment, differently in the early and advanced stage of cancer. Methods. One-hundred-two consecutive cancer patients were recruited. Measures. We administered the Social Provision Scale, the Mini-Mental Adjustment to Cancer, the Brief-COPE, and the SF-12 health survey. Results. No differences emerged in adjustment to cancer, coping relate variables and quality of life between stage III and stage IV patients. Subsequent analyses revealed that the stage of the disease moderated the relationships between fatalism and fighting spirit and those between physical health and both avoidance and problem-solving. Regardless of the stage of illness, positive thinking mediated between social support and fighting spirit. Conclusion. Although the average adjustment pattern was the same for early-stage and advanced patients, adjustment processes were different according to cancer stage. The results confirm that social support and disease stage are important for adjustment to cancer. Favouring acceptance, positive reframing, and humour, social support helped patients to be more determined in fighting the disease and contrasted helpless-hopelessness and anxious preoccupations.

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1. Introduction

The US National Institute of Cancer (PDQ Supportive and Palliative Care Editorial Board, 2017) defined adjustment as a continuous process in which the patient attempts to solve specific cancer-related problems, manage emotional distress, and increase mastery of or control over cancer-related life events. Embedded in this definition is the notion that a cancer diagnosis is a traumatic event for the person, and the associated distress persists long after the initial time of diagnosis (Brennan, 2001). Which factors prevent a negative adjustment and promote a positive

one? The literature suggests that social support, coping styles, disease stage, and demographic factors influence both adjustment to cancer and health-related quality of life (Matsushita, Matsushima, & Maruyama, 2005; Costanzo, Lutgendorf, Rothrock. Anderson, 2006; Falagas et al., 2007; Nausheen, Gidron, Peveler, & Moss-Morris, 2009). Previous research has extensively studied these variables often individually, and few studies have considered their interplay in relation to adjustment to cancer. In the present study, we examined how the adaptational outcomes differ between early-stage and advanced chemotherapy patients, and how disease stage alters the associations of both demographics and psychosocial factors with adjustment to cancer. Before presenting specific research hypotheses, we review the literature that has inspired the study.

Social support refers to the various forms of help that a person exchange in his social network including family members, relatives, and friends (Cohen, 2000). Previous research has shown that social support not only decreases hopelessness and depression (Somasundaram & Devamani 2016; Pinquart & Duberstein, 2010), but also reduce the risk of relapse (Ikeda, Kawachi, Iso, Iwasaki, Inoue, & Tsugane 2013; Epplein et al., 2011), disease progression (Nausheen et al., 2009), and mortality rates (Pinquart & Duberstein, 2009; Ikeda et al., 2013). Social support also affects how patients cope with cancer fostering hope, positive reframing and promoting proactive coping competences (Kim, Han, Shaw, McTavish, & Gustafson, 2010; Kawa, 2017; Nausheen et al., 2009).

The term coping applies to several processes and behaviors through which patients attempt to manage health distress. In a recent study, Baumstarck and colleagues (2017) have shown that cancer patients resort to four broad coping strategies: seeking social support, problem-solving, avoidance, and positive thinking. Patients who seek social support get emotional understanding from others, ask for help and advice, and find relief in religion or spiritual beliefs (Baumstarck et al., 2017).

Interestingly, spirituality and religion predict greater positive affect (Kaliampos, Roussi, 2017) and are related to a better quality of life during chemotherapy (Tarakeshwar, 2006; Cavanna, Bizzi & Charpentier-Mora, 2015). Problem-solving help patients to face the disease with a proactive attitude, focusing on doing something to improve the situation and thinking about adaptive strategies (Baumstarck et al., 2017).

The same study also showed that coping avoidance encompassed various cognitive and experiential attempts to escape from a stressor, such as reducing efforts to deal with the disease, diverting one's mind from cancer-related thoughts, or denying the disease. Last, positive thinking was a mix of positive reframing and acceptance (Baumstarck et al., 2017). Patients high

on this dimension typically learn to live with cancer, get on with life, and maintain a positive outlook toward treatment (Brandão, Schulz, & Matos, 2017; Warchala, Wojtyna, & Krysta, 2015). Positive thinking also predicts the better quality of life during the disease (Sales, Carvalho, McIntyre, Pavlidis, & Hyphantis, 2014).

Adjustment to cancer and coping are separate constructs (Anagnostopoulos, Kolokotroni, Spanea, & Chryssochoou, 2006). Specifically, adjustment to cancer denotes the adaptational outcomes of coping and comprises five specific cognitive, behavioral, and emotional reactions (Grassi et al., 2005). A good adjustment is characterized by "fighting spirit" (e.g., struggling with the disease and keeping a positive attitude) and "fatalism" (e.g., accepting the disease and reappraising the situation) (Grassi et al., 2005; Anagnostopoulos et al., 2006). Fighting spirit is linked to better health-related quality of life (Kawa, 2017; O'Brien & Moorey, 2010; Kvillemo & Branstrom, 2014). Although the word fatalism alludes to passive surrender, fatalism is deemed adaptive for cancer patients (Anagnostopoulos et al., 2006; Kvillemo & Branstrom, 2014). To avoid confounding, some scholars suggested dividing the fatalism construct into adaptive benefit-finding and passive fatalism (Wang, Tu, Liu, Yeh, & Hsu, 2013).

Anxious preoccupation and helplessness-hopelessness are negative types of adjustment that, if lasting more than three months, may give rise to an adjustment disorder (PDQ Supportive and Palliative Care Editorial Board, 2017). Not surprisingly both types predicted more intense health distress and worse quality of life (Johansson, Rydén, & Finizia, 2011; Ho, Fung, Chan, Watson, & Tsui, 2003).

Last, patients can adjust to cancer resorting to avoidance (e.g., denying the diagnosis or escaping cancer-related thoughts). Those who are more avoidant reported increased health distress, lower psychological functioning, and poorer health outcomes (Grassi et al. 2005; Hack, & Degner, 2004; O'Brien & Moorey, 2010; Kvillemo & Branstrom, 2014). Notwithstanding this, cognitive avoidance can be positive for cancer patients in critical periods (Vos & de Haes, 2007).

Due to the evolving nature of the construct (Brennan, 2001), adjustment to cancer is expected to be dependent on the stage of the disease. There is evidence that an advanced disease is associated with worse health-related quality of life (Hamel et al., 2016; Roets, Tukanova, Govarts, & Specenier, 2018; Sharma & Purkayastha, 2017). Yet, whether early-stage and advanced patients differently adjust to the disease still is a controversial issue. Several studies failed to detect significant differences between stage and adjustment (Manne, Glassman, & Du Hamel, 2001; Parker, Baile, De Moor & Cohen, 2003; Carver et al., 2005; Bardweell al., 2006; Shapiro, McCue, Heyman, Dey, & Haller, 2010). However, other studies have found higher adjustment problems in patients with advanced cancer (Waldmann, Fritzkuleit, Raspe, &

Katalinic, 2007; Brennan, 2001, Kvillemo & Branstrom, 2014; O'Brien and Moorey, 2010; Martino et al., 2018).

Disease stage can alter the relationships between coping and adjustment. For instance, Kvillemo & Branstrom (2014) showed that acceptance coping is associated with positive mood scores for women at more advanced stages. The same study also showed that avoidance is more strongly associated with negative affect for more advanced patients than early-stage ones.

O'Brien and Moorey (2010) suggested that the stage of disease can alter the relationships between coping, adjustment to cancer and mental health. For instance, in advanced patients, fighting spirit counteracted anxiety, depression, and mood disturbances (O'Brien & Moorey, 2010). Instead, acceptance coping was negatively related to depression in early-stage patients, and conversely in advanced disease patients. Taken together, this literature suggests that stage might affect both the average level of adjustment and the correlations of adjustment with social support and coping styles.

Regarding demographic factors, previous research has shown that women with cancer tend to report more depression, pain, disability than men (Faller et al., 2016; Koyama et al., 2016; Linden, Vodermaier, MacKenzie, & Greig, 2012; Peters, Mendoza Schulz, & Reuss-Borst, 2016), while younger patients typically have more adjustment problems than older patients (Burg et al., 2015; Faller et al., 2016; Hess & Chen, 2014; Linden et al., 2012). Indeed, gender and age need to be considered among the variables that might provide information about adjustment and health-related quality of life.

1.1 The present study

The aim of the present study was fourfold. First, we investigated whether age, gender, and stage affect the average level of adjustment to cancer. In keeping with the literature, we expect women and younger patients to show more adjustment problems than men and older patients as well as poorer quality of life. Regarding stage, an advanced disease is related to worse health-related quality of life. Mixed results have been reported for the association between the stage of cancer and adjustment.

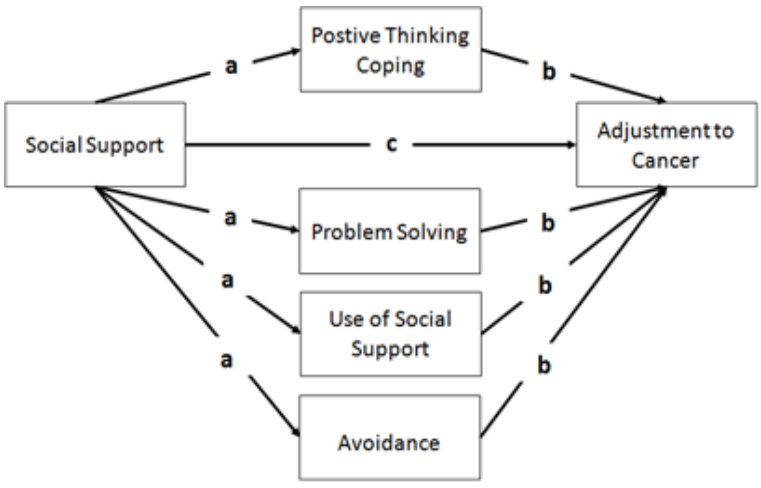
Therefore, although we expect more advanced patients to show greater adjustment problems and worse quality of life, it is also possible that no differences emerge regarding adjustment. Second, we examined how social support and coping styles are associated with adjustment to cancer and health-related quality of life. In keeping with the literature, we expect positive relations with better quality of life, fighting spirit, and fatalism as well as negative relations with helplessness-hopelessness and anxious preoccupation.

Regarding cognitive avoidance, the literature has provided mixed results. Hence, social support can be either positively or negatively associated with avoidance. We also expect coping strategies like positive thinking, problem-solving, and use of social support to be associated with better quality of life, more positive adjustment, and less negative adjustment. Given similarities in content, we also expect avoidance coping to be associated with avoidance adjustment.

Because social support can influence coping styles and because the adjustment to cancer is deemed to be the outcome of coping processes, the third aim of the study was to represent bivariate correlations in terms of mediation processes. As one can see from Figure 1, we expect the association between social support with positive and negative adjustments to cancer (c in figure 1) to be accounted for by individual differences in coping style. In order to quantify the expected mediation effects, we evaluated the product of coefficients (a and b in figure 1, details see methods).

We used the same conceptual and statistical framework to test hypotheses concerning the health-related quality of life. Last, we aimed to explore how the disease stage might impact on the strength of the relationships between social support, coping, and adjustment to cancer (i.e., moderation effects). The interplay of social support, coping strategies, and mental adjustment can vary according to cancer stage, underscoring the need for examining adjustment to cancer in patients at different stages of the disease. The conceptual model views the disease stage as an intervening variable in the correlations mentioned above.

Figure 1. Conceptual model tested in the study



2. Methods

2.1 Participants

The data used in this research were collected as part of a more extensive study on the perceived quality of healthcare in oncology settings as perceived by the patients. One-hundred-two consecutive patients were recruited from an anonymous oncology center in the city of Rome, Italy.

All participants were patients with a confirmed cancer diagnosis, who were receiving chemotherapy in day-treatment units. Inclusion criteria for the study were: a performance status (ECOG) of 0 or 1, age over 18 years old, written comprehension of the Italian language, ability to fill in a paper and pencil questionnaire.

Exclusion criteria were a refusal to cooperate, present or history of mental illness. Oncology doctors checked inclusion and exclusion criteria and provided medical information about stage and type of cancer. The refusal rate was around 5%.

No patient was excluded because of mental disorders. Patient characteristics are shown in Table 1.

The local ethical review board approved all aspects of this study. After being informed about the voluntary nature of participation, and the right to withdraw from the study at any moment, verbal consent was obtained from all patients before data collection.

Patients were also informed that data were anonymized at the source.

Table 1 Patient Characteristics

Variables		N	%
1. Age (M±SD)	(60.46±13.07)		
2. Gender	Female	64	62.8
	Male	38	37.3
3. Primary Tumor Site	Digestive System / Abdomen	30	29.4
	Female Genital Apparatus	17	16.7
	Breast	21	20.6
	Respiratory System / Thorax	22	21.6
	Urinary apparatus	3	2.9
	Male genital apparatus	4	3.9
	Other/Unspecified	5	4.9
4. Disease Stage	I	6	5.9
	II	13	12.8
	III	21	20.6
	IV	62	60.8

N=102

2.2 Instruments

Social support. We used the abridged Social Provision Scale (SPS-10; Caron, 2013), including 10 items selected from the parent instrument (Grassi, Rosti, Albertazzi, Marangolo, 1996). In particular, the SPS-10 includes 2 items for each of the 5 dimensions of social support: emotional support, social integration, reassurance of value, tangible and material assistance, and orientation. The SPS-10 uses the same four-point Likert scale as the SPS requiring patients to assess their level of agreement with each of the 10 statements (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). The SPS-10 provides a total score of social provision (Cronbach's $\alpha = 0.84$, in the present study).

Coping. The Brief-Cope Inventory (BC; Carver, 1997; Monzani et al., 2015) is a measure derived from the COPE Inventory. It is comprised of 28 items tapping into 14 habitual strategies that one can use to cope with stressful events or situations, such as acceptance, active coping, behavioral disengagement, denial, humor, planning, positive reframing, religion, self-blame, self-distraction, substance use, use of emotional support, use of instrumental support, and venting. The items can be administered 3 formats. In the present study, we used the "dispositional" format in which respondents were asked to report what they usually do when they are stressed. The response format is likert-type (1 = I don't do this at all - 4 = I do this a lot). According to Baumstrack and colleagues (2017), we obtained four summary measures: Positive Thinking (acceptance, humor, and positive reframing; $\alpha = .74$), avoidance (behavioral disengagement, denial, self-blame, self-distraction, and substance use; $\alpha = .53$), Problem-Solving (active coping and planning, $\alpha = .55$), and social support seeking (religion, use of emotional support, use of instrumental support, and venting $\alpha = .66$).

Adjustment to Cancer. The Italian version of the Mini-Mental Adjustment to Cancer includes 29 items (Grassi et al., 2005). The questionnaire uses a 4-point rating scale (1= Definitely does not apply to me - 4=Definitely applies to me). The Mini-MAC was devised to assess three adaptive (cognitive avoidance, fatalism, and fighting spirit) and two maladaptive dimensions of adjustment to cancer (helplessness-hopelessness, anxious preoccupation) (Anagnostopoulos et al., 2006). The Cronbach's reliability coefficients were .86, .45, .63, .89, .85 for cognitive avoidance, fatalism, fighting spirit, helplessness-hopelessness, and anxious preoccupation, respectively.

Quality of Life. The Italian version of the 12-item Short-Form Health Survey (SF-12; Apolone et al., 2001) was used to assess health-related quality of life. The survey uses various Likert-type response scales and provides mental and physical health component scores. Higher scores

indicate better health. In this study, the Cronbach's α were 0.79 and 0.77 for the mental and physical health scores, respectively.

Data Analysis

We used independent sample t-test to assess the differences in adjustment to cancer, coping styles, and social provision by stage (I-III Vs. IV), age (<60 Vs. ≥60 years), and gender. We used Pearson correlations to examine the relationships among adjustment to cancer, coping styles, and social provision. Mediation and moderation analyses were carried out using the SPSS PROCESS 3.0 macro. This regression-based method first examines whether the direct effect of the independent variable (e.g., social provision) on the dependent variable (e.g., adjustment fighting spirit) is significant, and then tests if the indirect effect of the independent variable through the mediator (e.g., positive thinking) is significantly different from 0. An indirect effect is the product of *a* and *b* coefficients corresponding to the regression of the mediator on the independent variable and the regression of the dependent variable on the mediator, respectively. A non-parametric bootstrapping procedure (with 10,000 bootstrap re-samples) generates a bias-corrected confidence interval (CI) for each indirect. A 95% CI that does not include zero indicates that the indirect effect is significant. The effect size was calculated using the mediation index (k^2). The bias-corrected percentile bootstrap approach provides enough statistical power for effect sizes around 0.40 with a sample size around 100 cases.

3. Results

3.1 Descriptive analyses.

Table 2 reports the sample descriptive statistics for all psychological variables broken down by disease stage, gender, and age groups. As it regards differences by stage, the analysis did not detect fully significant differences between patients at stage I-III relative to those in stage IV. The only marginally significant differences ($p < .10$) emerged in anxious preoccupation and positive thinking. The patients in the IV stage group were more anxious and less apt to cope with the disease through positive reframing, humour, and acceptance. We found significant gender differences in fatalism. Women were apter than men to resort to spiritual resources (e.g., putting themselves in the hands of God) and lived day-by-day (e.g., taking one day at a time). Regarding age differences, our data did not support the fully significant difference between patient over 60 years old and under 60 years old. There was a tendency for the older group of patients to cope with the disease through less use of social support, in terms of venting, and emotional support.

Table 2. Sample descriptive statistics and Independent Samples t-test by Disease Stage, Gender, and Age

Variables	Stage I-III		Stage IV		t		Females		Males		t		Age < 60		Age>60		t	
SF-12 PHYSICAL HEALTH	39.43	8.35	36.43	10.39	1.49		36.92	9.72	38.85	9.66	-0.93		38.72	9.18	36.70	10.10	0.98	
SF-12 MENTAL HEALTH	45.15	13.19	46.02	12.11	-0.33		44.22	13.88	48.16	9.32	-1.49		46.34	12.57	45.03	12.12	0.5	
MAC-HEPLESSNESS	12.40	4.48	13.85	5.28	-1.43		13.35	5.28	13.16	4.59	0.19		13.56	5.34	13.02	4.59	0.54	
MAC-ANXIETY	15.32	4.92	17.05	5.03	-1.69	†	16.52	5.49	16.16	4.19	0.35		16.18	4.63	16.34	5.22	-0.16	
MAC-AVOIDANCE	12.20	2.62	11.88	2.74	0.58		12.06	2.83	11.92	2.45	0.26		11.41	2.83	12.27	2.49	-1.59	
MAC-FATALISM	11.03	2.09	11.00	2.45	0.05		11.49	2.46	10.21	1.77	2.80	*	11.03	2.35	11.00	2.31	0.05	
MAC-FIGHTING SPIRIT	16.49	2.52	16.21	2.54	0.53		16.35	2.64	16.27	2.34	0.15		16.67	2.43	15.98	2.53	1.33	
BC-POSITIVE THINKING	17.59	3.45	16.30	4.02	1.65	†	17.00	4.12	16.47	3.33	0.66		17.41	3.47	16.33	3.86	1.4	
BC-AVOIDANCE	19.15	3.85	18.77	4.47	0.44		19.08	4.21	18.64	4.28	0.50		18.62	3.41	17.98	2.98	0.96	
BC-PROBLEM SOLVING	11.62	2.17	12.20	2.39	-1.23		11.85	2.30	12.16	2.36	-0.64		12.08	2.38	11.82	2.26	0.53	
BC-SOCIALSUPPORT	18.21	3.28	18.45	3.15	-0.37		18.74	3.07	17.70	3.32	1.58		19.92	3.67	18.44	4.41	1.72	†
SPS-SOCIAL PROVISION	34.23	4.23	33.77	5.18	0.46		33.90	4.92	34.03	4.72	-0.12		34.62	4.71	33.41	4.88	1.2	

† p <.10, * p < .05, ** p < .01, *** p < .001

Note. SPS-SOCIAL PROVISION = 10-Item Social Provision Scale; BC = Brief Cope Inventory; SF-12 = 12-Item Short Form Survey; MAC = Mini Mental Adjustment to Cancer.

3.2 Correlations among study variables. Pearson's correlations are reported in Table 3. The amount of social support provided to the patient by his/her informal network was associated positively with a fighting spirit and negatively with anxious preoccupation. The social support provision was also correlated with all four aspects of coping, and, in particular, with the positive thinking dimension. Positive thinking was negatively correlated with helplessness–hopelessness and anxious preoccupation and positively associated with fighting spirit. The avoidance coping was positively related to all dimensions of adjustment except for the helplessness–hopelessness. The problem-solving was correlated with fighting spirit, only. Those who adjusted to cancer showing greater willingness to fight the disease made more deliberate attempts to take actions aimed to change a threatening situation. The social support coping, differing from the social provision because the former implies the habitual use of support while the latter refers to the amount of help provided by the network, was correlated positively with both fatalism and fighting spirit. Patients who faced the disease using the help of their acquaintances fought with greater determination and fatalism. The SF-12 physical health score was unrelated to adjustment, coping, and social provision. The only significant link was with the SF-12 mental health score. In turn, the latter was negatively correlated with helplessness–hopelessness and anxious preoccupation, and positively with fighting-spirit, positive thinking, and social provision.

Table 3. Pearson correlations among study variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	12.
1. SF-12 PHYSICAL HEALTH	—												
2. SF-12 MENTAL HEALTH	.32 **	—											
3. MAC-HEPLESSNESS	-.15	-.43 ***	—										
4. MAC-ANXIETY	-.15	-.48 ***	.67 ***	—									
5. MAC-AVOIDANCE	.05	-.15	.23 *	.33 **	—								
6. MAC-FATALISM	.02	-.03	.05	.02	.38 ***	—							
7. MAC-FIGHTING SPIRIT	.08	.34 ***	-.28 **	-.23 *	.18	.31 **	—						
8. BC-POSITIVE THINKING	.03	.38 ***	-.31 **	-.44 ***	-.11	.14	.45 ***	—					
9. BC-AVOIDANCE	.05	-.05	.19	.30 **	.42 ***	.35 ***	.20 *	.15	—				
10. BC-PROBLEM SOLVING	-.07	.18	.00	-.05	.00	.09	.33 **	.37 ***	.31 **	—			
11. BC-SOCIALSUPPORT	-.08	-.04	-.09	-.09	-.01	.26 **	.21 *	.34 ***	.28 **	.23 *	—		
12. SPS-SOCIAL PROVISION	.14	.22 *	-.19	-.23 *	.03	.11	.35 ***	.42 ***	.22 *	.24 *	.25 *	—	

* p < .05, ** p < .01, *** p < .001

For all scales, higher scores are indicative of more extreme responding in the direction of the construct assessed. SPS-SOCIAL PROVISION = 10-Item Social Provision Scale; BC = Brief Cope Inventory; SF-12 = 12-Item Short Form Survey; MAC = Mini Mental Adjustment to Cancer.

3.3 Mediation analyses. Because adjustment to cancer and quality of life measures are widely acknowledged as psychosocial and health outcomes in clinical oncology, we analyzed how social provision might be associated with these outcomes indirectly through coping. Table 4 reports a summary of these analyses. Consistent with the correlations reported above, social provision was unrelated to the SF-12 physical health score. By contrast, the social provision was indirectly related to SF-12 mental health score, hopelessness-helplessness, anxious preoccupation, and fighting spirit through positive thinking. The mediation index k^2 (i.e., an effect size measure) assessed for these indirect relationships showed that the links between social provision and the different outcomes through positive thinking were more important to counteract the feelings of helplessness-hopelessness and anxious preoccupation and to promote the mental health. Although of lesser importance (i.e., lower effect size), we found significant indirect relationships between social provision and adverse health outcomes, such as helplessness-hopelessness and anxious preoccupation, cognitive avoidance, and fatalism. In these analyses, the mediator was the avoidance coping. Foreshadowing the discussion, these results might suggest an ineffective function of mutual protection between the patient and his closest acquaintances (e.g., the family members).

Table 4. Summary Table of Mediation Analyses

Table 4. Summary Table of Mediation Analyses

Outcome	Mediator	a	b	axb	BootSE	LLCI	ULCI	MI	c'
SF-12 PHYSICAL HEALTH									
	BC-POSITIVE THINKING	0.30 **	0.17	0.05	0.12	-0.17	0.31	.02	.15
	BC-AVOIDANCE	0.13 *	0.30	0.04	0.06	-0.07	0.18	.02	
	BC-PROBLEM SOLVING	0.09	-0.62	-0.06	0.07	-0.24	0.03	-.03	
	BC-SOCIALSUPPORT	0.19 *	-0.41	-0.08	0.06	-0.21	0.04	-.04	
SF-12 MENTAL HEALTH									
	BC-POSITIVE THINKING	0.30 **	1.39 **	0.42	0.18	0.12	0.81	.16 **	.10
	BC-AVOIDANCE	0.13 *	-0.44	-0.06	0.08	-0.27	0.07	-.02	
	BC-PROBLEM SOLVING	0.09	0.53	0.05	0.07	-0.07	0.21	.02	
	BC-SOCIALSUPPORT	0.19 *	-0.49	-0.09	0.08	-0.25	0.05	-.03	
MAC-HEPLESSNESS									
	BC-POSITIVE THINKING	0.34 **	-0.48 **	-0.16	0.06	-0.30	-0.05	-.16 **	-.08
	BC-AVOIDANCE	0.15 *	0.35 *	0.05	0.04	0.00	0.15	.05 *	
	BC-PROBLEM SOLVING	0.11 *	0.17	0.02	0.03	-0.03	0.08	.02	
	BC-SOCIALSUPPORT	0.21 *	-0.06	-0.01	0.03	-0.09	0.04	-.01	
MAC-ANXIETY									
	BC-POSITIVE THINKING	0.33 **	-0.68 **	-0.23	0.06	-0.37	-0.12	-.22 **	-.08
	BC-AVOIDANCE	0.14 *	0.59 **	0.09	0.05	0.01	0.20	.08 *	
	BC-PROBLEM SOLVING	0.11 *	0.11	0.01	0.03	-0.03	0.09	.01	
	BC-SOCIALSUPPORT	0.21 *	-0.06	-0.01	0.03	-0.08	0.05	-.01	
MAC-AVOIDANCE									
	BC-POSITIVE THINKING	0.30 **	-0.11	-0.03	0.03	-0.09	0.02	-.06	.05

BC-AVOIDANCE	0.13	*	0.39	**	0.05	0.03	0.00	0.12	.09	*	
BC-PROBLEM SOLVING	0.11	*	-0.12		-0.01	0.02	-0.05	0.01	-.02		
BC-SOCIALSUPPORT	0.20	*	-0.06		-0.01	0.02	-0.05	0.02	-.02		
MAC-FATALISM											
BC-POSITIVE THINKING	0.32	**	0.07		0.02	0.02	-0.02	0.07	.05		.00
BC-AVOIDANCE	0.14	*	0.22	**	0.03	0.02	0.00	0.08	.07	*	
BC-PROBLEM SOLVING	0.07	*	-0.10		-0.01	0.02	-0.05	0.02	-.02		
BC-SOCIALSUPPORT	0.22	*	0.12	*	0.03	0.02	0.00	0.07	.06		
MAC-FIGHTING SPIRIT											
BC-POSITIVE THINKING	0.31	**	0.24	**	0.07	0.03	0.03	0.14	.14	**	.17
BC-AVOIDANCE	0.14	*	0.06		0.01	0.01	-0.02	0.04	.02		
BC-PROBLEM SOLVING	0.10	*	0.16		0.02	0.02	-0.01	0.05	.03		
BC-SOCIALSUPPORT	0.19	*	0.02		0.00	0.01	-0.02	0.04	.01		

* p < .05, ** p < .01, *** p < .001

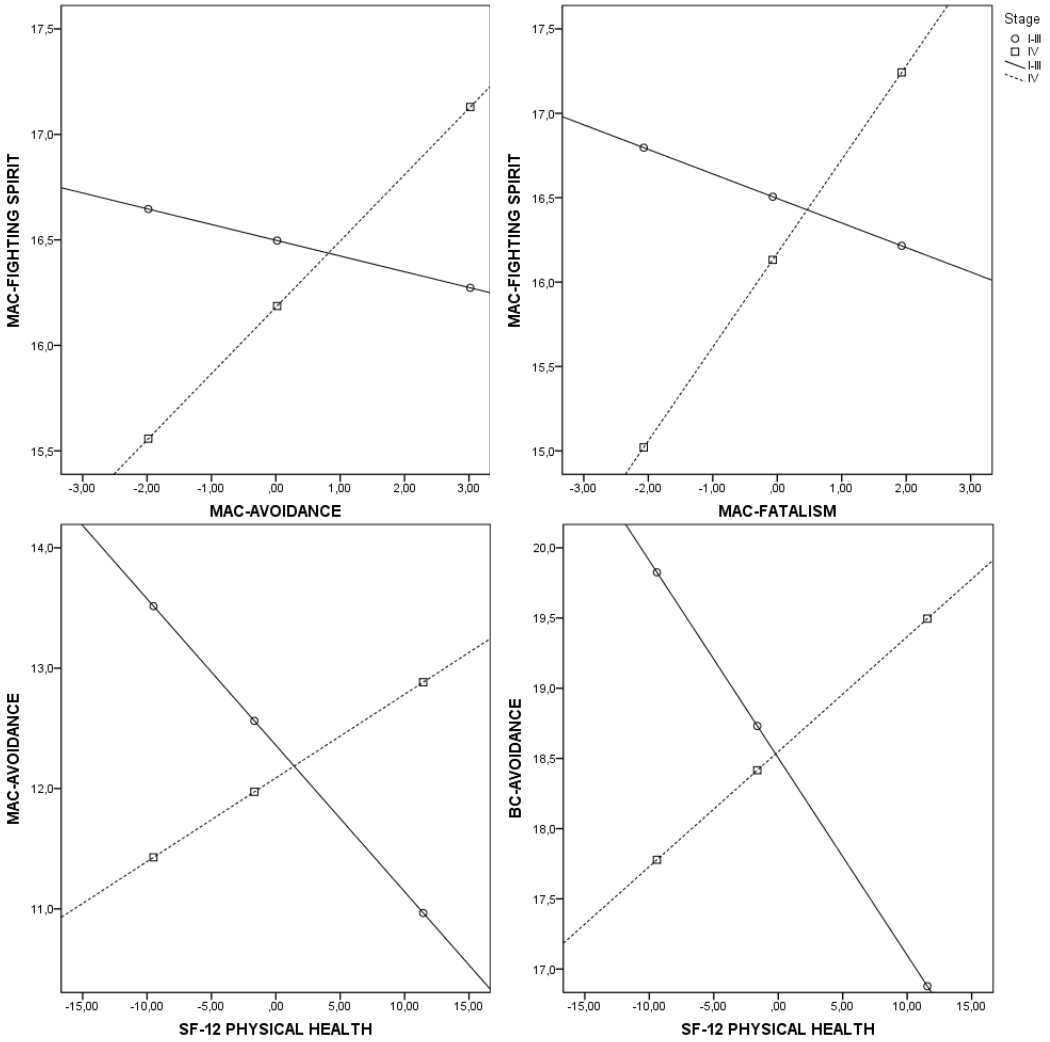
Note: BC = Brief Cope Inventory; SF-12 = 12-Item Short Form Survey; MAC = Mini Mental Adjustment to Cancer.

3.4 Moderation analyses. Previous descriptive analyses showed that the disease stage had a limited role as a determinant of differences in the average adjustment. However, the stage might also impact on the strength of the relationships between the study variables. Accordingly, we explored the data looking for bivariate correlations that might be different between stage I-III and stage IV groups. This analysis served as a screening for potential moderating effects, which were subsequently tested as interactions in regression analyses.

The correlations between fighting spirit and cognitive avoidance ($r_{I\text{-}III}$ = -.01; r_{IV} = .34) and between fighting spirit and fatalism ($r_{I\text{-}III}$ = -.34; r_{IV} = .54) were significantly different by stage (Z = 1.99, p = .046 and Z = 3.12, p = .002). Likewise, the correlations between SF-12 physical health score and cognitive avoidance ($r_{I\text{-}III}$ = -.38; r_{IV} = .28) and between SF-12 physical health and avoidance coping ($r_{I\text{-}III}$ = -.36; r_{IV} = .28) were significantly different by stage (Z = 3.13, p = .002 and Z = 2.13, p = .004). Figure 1 reports significant interactions in regression analyses. For stage I-III patients, a lesser fighting spirit was associated with greater cognitive avoidance ($F_{1,95}$ = 4.15, p = .044) and fatalism ($F_{1,95}$ = 10.04, p = .002), and conversely for stage IV patients.

Likewise, for patients in the stage I-III, a greater SF-12 physical health score was associated with lesser cognitive avoidance and habitual avoidance coping ($F_{1,90}$ = 10.41, p = .002 and $F_{1,88}$ = 8.68, p = .004, respectively), and conversely for those in stage IV.

Figure 1. Stage of disease and relationships among variables.



Note: BC = Brief Cope Inventory; SF-12 = 12-Item Short Form Survey; MAC = Mini Mental Adjustment to Cancer.

4. Discussion

The interplay of social support, coping styles, and adjustment to cancer is a long-standing topic of interest in health psychology and psycho-oncology (Nausheen et al., 2009, Pinquart & Duberstein, 2009, 2010; Svensson, Christiansen, Ulrichsen, Rørth, Sørensen, 2017; Liao et al. 2014). In the present study, we tested several hypotheses concerning adjustment to cancer in early and advanced chemotherapy patients in a day-treatment oncology unit. First, we investigated whether men and women, older and younger patients, early-stage and advanced patients reported different levels of adjustment. These hypotheses were inspired by previous research showing that female gender and younger age were risk factors for helplessness-hopelessness, anxious preoccupation, and cognitive avoidance (Burg et al., 2015; Faller et al., 2016; Hess & Chen, 2014; Koyama et al., 2016; Linden et al., 2012; Peters et al., 2016).

With few exceptions, however, age, gender, and stage groups did not differ in the average levels of adjustment to cancer. While we expected women and younger patients to show more adjustment problems than men and older patients, the literature has provided less consistent results about the relationships between an advanced stage and poorer adjustment (Manne et al., 2001; Parker et al., 2003; Carver et al., 2005 Bardweell al., 2006; Shapiro et al., 2010; Waldmann et al., 2007; Brennan, 2001, Kvillemo & Branstrom, 2014; O'Brien and Moorey, 2010). Although it was logical to expect more advanced patients to show greater adjustment problems and worse quality of life, we did not detect any average difference in adjustment to cancer, except for tendencies for advanced patients to be more anxious, preoccupied, negative and pessimistic. Our findings are indeed more consistent with part of the literature reporting no statistical association between cancer stage and adjustment (e.g., Manne et al., 2001; Parker et al., 2003).

Second, we examined how social support and coping styles were associated with adaptational outcomes and quality of life. In keeping with the literature, we expected higher social support to be associated with better quality of life, more positive adjustment, and less negative adjustment. Our hypotheses were overall confirmed. For instance, social support from the personal network of the patient was correlated with more fighting spirit, less anxious preoccupation, less helplessness-hopelessness, better mental health and positive thinking. These correlations are consistent with previous studies demonstrating the crucial role of social support in the adjustment process (Somasundaram & Devamani 2016; Pinquart & Duberstein, 2010; Kim et al., 2010; Yağmur & Duman, 2016; Kawa, 2017; Nausheen et al., 2009). The social support network nourishes the motivation to actively face the changes associated with the disease and channels the energy needed to manage the many stressful events that the patient must endure.

Another common thread emerging from the correlation table was the positive relation of avoidance coping with fatalism and fighting spirit. In general, the use of passive coping strategies, like avoidance, was negatively associated with patient's quality of life, social support strategies, and psychological adjustment (Langford et al., 2017; Baumstarck et al., 2017; Schroevers, Kraaji, & Garnefski, 2011; Kvillemo, & Branstrom 2014; Roesch 2005). Our results seem to move in ways inconsistent with the above studies. Patients who disengaged mentally from the situation were more anxious but also more fatalistic and more fighting. Because a fatalistic attitude might reflect a mindful acceptance without resignation, avoidance coping, as claimed by previous researchers (e.g., Vos, & de Haes, 2007), may be beneficial not only because it allows people to reduce the pressure of a dangerous situation but also because it might contrast feelings of despair and impotence, by soliciting proactivity (Anagnostopoulos et al., 2006; Johansson al., 2011).

The third aim of the study was to test the mediation hypothesis to have an insight into the processes that might link social support with adjustment to cancer. In keeping with previous research (Somasundaram & Devamani 2016; Pinquart & Duberstein, 2010; Kim et al., 2010; Kawa, 2017; Nausheen 2009), we expected the association between social support provided by the patient's social network with positive and negative adjustment to cancer to be accounted for by individual differences in coping styles. Mediation analyses supported the hypotheses, suggesting that the social support network not only might promote fighting spirit and preserve mental health but also might defuse anxious preoccupation and helplessness-hopelessness. Thus, both early-stage and advanced patients, who received more help from their acquaintances and family members, adjusted to cancer with stronger determination to fight, lesser apprehension, and greater confidence in a successful outcome, presumably because they habitually coped with severe stresses in their life maintaining a positive attitude. In the view of Baumstrack et al. (2017), positive thinking encompassed greater acceptance, positive reframing, and humor. Accordingly, our data suggest that patients who were more strongly supported also adjusted to cancer more positively, attempting to live with the disease, valuing the secondary benefits, and joking about the situation or discovering its ridiculous aspects.

Are social support and coping styles differently associated with adjustment to cancer in early and advanced stages? Our study has shown that the stage of the disease changed the association of cognitive avoidance (as measured by the MAC) with the fighting spirit and the SF-12 physical health score. For early-stage patients, cognitive avoidance was negatively related to both fighting spirit and physical health quality. Early-stage patients, who tried as hard as they could not think about the disease, did not associate this positive adjustment with greater determination to defeat a tumor or with more positive attitudes during therapy. By contrast, cognitive avoidance became more adaptive for more advanced patients, being positively associated with SF-12 physical health and fighting spirit. Previous research (e.g., Anagnostopoulos et al., 2006) considered cognitive avoidance as an adaptive form of adjustment. Underlying this assumption is the belief that a patient that seeks for distraction thinks less about the illness, and therefore feel calmer and more serene. Our data partly disconfirm this assumption, at least for early-stage patients. However, cross-sectional data always have a twofold interpretation. On the one hand, early-stage patients, who cognitively avoided the disease, also fought with less determination and perceived themselves in worse physical health status. On the other hand, worse physical health in the early stages might be appraised negatively, discouraging the patient's hope, and triggering cognitive avoidance as a defensive reaction to the negative appraisal of the diagnosis and symptom severity.

Another interaction involving stage and type of adjustment emerged for the relationship between fatalism and fighting spirit. Advanced patients adjusting to the disease with more fatalistic beliefs were also more apt to fight for their health actively. By contrast, early-stage patients reporting a fatalistic view of their illness accepted the situation with more resignation. Previous research debated the dual nature of fatalism in the context of adjustment to cancer. On the one hand, fatalism can be adaptive if the patient can find out a new sense of life in the traumatic experience of cancer (Wang et al., 2013). If the passive dimension prevails, a 'stoic acceptance' of the disease, especially if prolonged over time, may turn out helplessness (Johansson et al., 2011). Our data suggest that advanced patients focused more on the adaptive aspects of fatalism, relied on God's help, appreciated the positive aspects of life, were focused on the present and did not renounce to fight the disease within the limits of their health conditions. It also looks like that early-stage patients assumed a passively fatalistic attitude that prevented them from viewing the disease as a challenge to overcome.

Last, the stage of the disease was unrelated to the perceived physical functioning. Nevertheless, this perception was related to the patient's mental health status which, in turn, was correlated with more fighting spirit, more positive thinking, less anxious preoccupation and helplessness-hopelessness. In keeping with a bio-psycho-social view, there might be several interconnections among the medical stage of the disease, the stage-related consequences on the physical functioning of the patient (e.g., lack of energy and fatigue, pain and discomfort, altered sleep patterns), patient's emotional appraisal of his/her health, coping reactions, social provision, and adjustment. Regardless of the stage of cancer, the patient's mental health is vital for a successful adaptation to the struggles encountered during the illness. This interpretation is consistent with classic studies using the US population norms for the Medical Outcomes Study showing that, although physical functioning declines with the development of severe chronic diseases, mental health tend to remain stable

Our study has some noteworthy limitations. First, the sample size was relatively small, and the patients were recruited from a single oncology treatment center. Although the number of patients was adequate for performing regression analyses and test moderation and mediation hypotheses, it precluded us from better stratifying the stage of the disease (e.g., an equal number of cases in each of the four stages). Second, our participants were out-patients receiving either adjuvant chemotherapy (after primary treatment) or standard chemotherapy to reduce tumor size or to prevent metastatic cancer from spreading. As a result, all the patients had a performance status (ECOG) of 0 or 1, at worse, being restricted in physically strenuous activity but able to carry out sedentary or light work. Future studies should try to include at least ECOG 2 patients to enlarge the variability of the functional and mental impairment. A third limitation

of our study was the cross-sectional design that not allowed us to establish causal relationships. All interpretations regarding directional effects are based on previous research. Future studies should try to follow up the patients with a longitudinal design, which allows for establishing intraindividual changes regarding social support, coping and adjustment, linked with the progression of the disease.

Notwithstanding these limitations, our study has shown that the stage of the disease had a limited role in determining an average difference between groups of patients. Instead, the stage of the disease was a significant moderating factor concerning with the interplay of cognitive avoidance and fatalism with the fighting spirit and perceived quality of physical health. Furthermore, in keeping with previous research, we showed that individual differences in social support and positive thinking interacted to counteract a negative adjustment to cancer in all the stages, reducing anxious preoccupation and helplessness-hopelessness, and fostering fighting spirit, that is a widely recognized adjustment in looking for more effective strategies to deal with cancer and its symptoms.

5. Clinical Implications

Before concluding, it is worth noting that our findings might have clinical implications for addressing patients needs in the medical setting. An active interest of significant others may influence the patient's choice of specific coping strategies as well as sustain his/her hope, sense of control, meaning of life, spirituality and religious beliefs (e.g., Merlo, 2016; Cavanna, Bizzi & Charpentier-Mora, 2015), bringing him/her to lean on active coping strategies rather than passive or avoidance ones. For this reason, the assessment of social support and mental adaptation was encouraged by several authors to identify the specific weaknesses and resources of each patient (Matsushita et al., 2005, Kim et al., Langford et al., 2017) and to capture the conditions of the specific situation, ideally following the logic of the case study method (Langher, Caputo, Martino, 2017). Promoting patient participation in a group setting may also provide different forms of psychological support and help them to cope with the problems of everyday life (Caputo, 2014). Knowing the features of each patient's social support network allows psychological intervention on its most intimate relationships, to foster communication, where necessary, between patient and family, and to identify patients with maladaptive adjustment responses in order to improve adaptive responses (Johansson et al., 2011). For example, two critical situations arise when the family appears disoriented, or unable to provide adequate emotional and instrumental support to the patient, or when, not infrequently, both the

patient and his/her caregivers want to protect each other by hiding concerns and fears (Shin et al., 2015).

The maladaptive adjustment styles should be another target of psychological intervention in a health setting. Along with anxious preoccupation and helplessness-hopelessness adjustment, avoidance is also an adaptational outcome that is risky for the well-being and health of the patient. Trying to act as if the disease was not present can hinder the favourable resolution of negative emotions and adaptive adjustment to cancer. The avoidance strategies in our study seem to hinder the determination to combat and prejudice the patient's mood. Introducing the assessment of psychosocial variables in cancer patient care allows the implementation of interventions that might alleviate cancer-related stress.

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